

Supporting Information of α -Hydroxy Phosphonates

Di-iso-propyl-1-hydroxy-1-phenylmethylphosphonate, 3c: M.p. = 97-98 °C, IR (KBr): $\nu = 3270, 2984, 1453, 1379, 1227, 747, 657, \text{cm}^{-1}$; ^1H NMR (300 MHz, CDCl_3): $\delta = 1.14$ (d, $J = 6$ Hz, 3H), 1.26 (d, $J = 6$ Hz, 9H), 3.70 (br s, -OH), 4.56 - 4.68 (2H, m), 4.96 (d, $^1J_{\text{HP}} = 11.1$ Hz, 1H) 7.29 (m, 3H, ArHs), 7.52 (d, $J = 7.8$ Hz, 2H, ArHs), ^{13}C NMR (75.4 MHz, CDCl_3): $\delta = 23.54$ (d, $^3J_{\text{CP}} = 4.5$ Hz), 23.83 (d, $^3J_{\text{CP}} = 4.5$ Hz), 24.02 (d, $^3J_{\text{CP}} = 3.75$ Hz), 24.14 (d, $^3J_{\text{CP}} = 3.0$ Hz), 71.06 (d, $^1J_{\text{CP}} = 159.0$ Hz, PCOH), 71.72 (d, $^2J_{\text{CP}} = 7.25$ Hz), 72.02 (d, $^2J_{\text{CP}} = 6.75$ Hz), 127.25, 127.17, 127.90, 128.80 ppm; HRMS: Mass calculated for $\text{C}_{13}\text{H}_{21}\text{O}_4\text{P}$: 273.1256 (M+H) and 295.1074 (M+Na); Obs. mass 273.0682 (M+H) and 295.1072 (M+Na).

Di-iso-propyl-1-hydroxy-1-(4-chlorophenyl) methylphosphonate, 3f: M.p.= 130-132 °C, IR (KBr): $\nu = 3263, 2981, 1491, 1376, 1233, 837, 765 \text{ cm}^{-1}$, ^1H NMR (300 MHz, CDCl_3): $\delta = 1.18$ (d, $J = 6$ Hz, 3H), 1.28 (d, $J = 6$ Hz, 9H), 3.42 (br s, -OH), 4.61-4.68 (m, 2H), 4.94 (d, $^1J_{\text{HP}} = 10.8$ Hz, 1H) 7.31 (d, $J = 6.9$ Hz, 2H, ArHs) 7.42 (d, $J = 6.9$ Hz, 2H, ArHs), ^{13}C NMR (75 MHz, CDCl_3): $\delta = 23.63$ (d, $^3J_{\text{CP}} = 4.5$ Hz), 23.88 (d, $^3J_{\text{CP}} = 4.5$ Hz), 23.96 (d, $^3J_{\text{CP}} = 4.5$ Hz), 24.09 (d, $^3J_{\text{CP}} = 4.5$ Hz), 70.64 (d, $^1J_{\text{CP}} = 160.5$ Hz, PCOH), 71.83 (d, $^2J_{\text{CP}} = 6.75$ Hz), 72.16 (d, $^2J_{\text{CP}} = 6.75$ Hz), 128.20 128.51, 133.61, 135.39, HRMS: Mass calculated for $\text{C}_{13}\text{H}_{20}\text{PO}_4\text{Cl}$: 307.7302 (M+H) and 329.7120 (M+Na); Obs. mass 307.2793 (M + H) and 329.3219 (M + Na).

Di-iso-propyl-1-hydroxy-1-(4-methylphenyl) methylphosphonate, 3i:

M. p. = 122-124 °C, ^1H NMR (300 MHz, CDCl_3): $\delta = 1.15$ (d, $J = 6$ Hz, 3H), 1.26 (d, $J = 6.0$ Hz, 9H), 2.35 (s, 3H), 3.25 (br s, OH), 4.58- 4.67 (m, 2H), 4.99 (d, $^1J_{\text{HP}} = 10.2$ Hz, 1H) 7.14 (d, $J = 7.8$ Hz, 2H, ArHs) 7.35 (d, $J = 6.6$ Hz, 2H, ArHs), ^{13}C NMR (75 MHz,

CDCl₃): 21.21 (CH₃), 23.60 (d, ³J_{CP} = 5.3 Hz), 23.88 (d, ³J_{CP} = 4.2 Hz), 24.10 (d, ³J_{CP} = 3.7 Hz), 24.19 (d, ³J_{CP} = 3.0 Hz), 70.91 (d, ¹J_{CP} = 159.85 Hz, ArCH), 71.49 (d, ²J_{CP} = 7.5 Hz), 71.77 (d, ²J_{CP} = 6.8 Hz), 127.10, 128.77, 133.50, 137.48; HRMS: Mass calculated for C₁₄H₂₃O₄P: 287.1413(M+H) and 309.1231(M+Na); Obs. mass 287.2484 (M + H) and 309.2472 (M + Na).

Di-iso-propyl-1-hydroxy-1-(4-methoxyphenyl) methylphosphonate, 3k: M. p. = 152-153 °C, IR (KBr): ν = 3271, 2979, 1614, 1512, 1378, 1227, 998, 837, 673, 558 cm⁻¹, ¹H NMR (300 MHz, CDCl₃): δ = 1.13 (d, J = 6 Hz, 3H), 1.27 (d, J = 6.3 Hz, 9H), 2.76 (br s, OH), 3.80 (s, 3H) 4.56- 4.66 (m, 2H), 4.88 (d, ¹J_{HP} = 10.2 Hz, 1H) 6.88 (d, J = 8.7 Hz, 2H, ArHs) 7.40 (d, J = 8.6 Hz, 2H, ArHs), ¹³C NMR (75 MHz, CDCl₃): 23.59 (d, ³J_{CP} = 5.25 Hz), 23.87 (d, ³J_{CP} = 5.25 Hz), 24.06 (d, ³J_{CP} = 3.75 Hz), 24.16 (d, ³J_{CP} = 3.75 Hz), 55.24 (OCH₃), 70.57 (d, ¹J_{CP} = 147 Hz, ArH), 71.87 (d, ²J_{CP} = 7.5 Hz), 113.57, 113.60, 128.56, 128.64, 128.75, 159.42; HRMS: Mass calculated for C₁₄H₂₃O₅P: 303.1362 (M+H) and 325.1180 (M+Na); Obs. mass 303.3655 (M + H) and 325.3070 (M + Na).

Di-iso-propyl-1-hydroxy-1-(4-iso-propylphenyl) methylphosphonate, 3m: M.p. = 118-119 °C, IR (KBr): ν = 3270, 2978, 1513, 1238, 993 cm⁻¹, ¹H NMR (300 MHz, CDCl₃): δ = 1.09 (d, J = 6 Hz, 3H), 1.23 (brs, 15H), 2.64 (br s, -OH), 2.89 (m, 1H), 4.55-4.68 (m, 2H), 4.88 (d, ¹J_{HP} = 10.8 Hz, 1H) 7.18 (d, J = 8.1 Hz, 2H, ArH) 7.40 (d, J = 8.3 Hz, 2H, ArH), ¹³C NMR (75 MHz, CDCl₃): δ = 23.44 (d, ³J_{CP} = 5.0 Hz), 23.81 (d, ³J_{CP} = 5.25 Hz), 23.95 (2 x CH₃), 24.03 (d, ³J_{CP} = 3.75 Hz), 24.15 (d, ³J_{CP} = 3.00 Hz), 33.81, 70.92 (d, ¹J_{CP} = 160.5 Hz, CPOH), 71.58 (d, ²J_{CP} = 7.5 Hz), 71.92 (d, ²J_{CP} = 7.5 Hz) 126.10, 127.31, 134.26, 148.53; HRMS: Mass calculated for C₁₆H₂₇O₄P: 315.1726 (M+H) and 337.1544 (M+Na); Obs. mass 315.1547 (M+H) and 337.1077 (M+Na).

Di-iso-propyl-1-hydroxy-1-(3-nitrophenyl) methylphosphonate, 3o: M.p. = 106-108 °C, IR (KBr): $\nu = 3256, 2983, 1532, 1347, 1337, 1209, 995, 813, 688, 572 \text{ cm}^{-1}$, ^1H NMR (300 MHz, CDCl_3): $\delta = 1.28$ (d, $J = 6 \text{ Hz}$, 12H), 4.60-4.65 (m, 2H) 5.11 (d, $^1J_{\text{HP}} = 11.4 \text{ Hz}$, 1H) 7.50 (t, $J = 8.1 \text{ Hz}$, 1H, ArH) 7.81 (d, $J = 7.5 \text{ Hz}$, 1H, ArH) 8.13 (d, $J = 8.1 \text{ Hz}$, 1H, ArH), 8.42 (br s, 1H, ArH), ^{13}C NMR (75 MHz, CDCl_3): $\delta = 23.68$ (d, $^3J_{\text{CP}} = 5.2 \text{ Hz}$), 23.86 (d, $^3J_{\text{CP}} = 3.75 \text{ Hz}$), 23.93 (d, $^3J_{\text{CP}} = 5.2 \text{ Hz}$), 24.08 (d, $^3J_{\text{CP}} = 3.0 \text{ Hz}$), 70.00 (d, $^1J_{\text{CP}} = 160.5 \text{ Hz}$, PCOH), 72.16 (d, $^2J_{\text{CP}} = 7.5 \text{ Hz}$), 72.72 (d, $^2J_{\text{CP}} = 7.5 \text{ Hz}$), 122.21, 122.52, 128.72, 133.17, 139.70, 148.40; HRMS: Mass calculated for $\text{C}_{13}\text{H}_{20}\text{NO}_6\text{P}$: 318.2827 (M+H) and 340.2645 (M+Na); Obs. mass 318.1630 (M+H) and 340.3884 (M+Na).

Di-iso-propyl-1-hydroxy-1-(4-cyanophenyl) methylphosphonate, 3q: M.P. = 128-130 °C, IR (KBr): $\nu = 3410, 2983, 2233, 1608, 1385, 765, 578 \text{ cm}^{-1}$, ^1H NMR (300 MHz, CDCl_3): $\delta = 1.25$ (d, $J = 6.4 \text{ Hz}$, 12H), 4.62 - 4.74 (m, 2H), 5.04 (d, 1H, $^1J_{\text{HP}} = 12.3 \text{ Hz}$), 7.62 (s, 4H), ^{13}C NMR (75 MHz, CDCl_3): $\delta = 23.64$ (d, $^3J_{\text{CP}} = 5.25 \text{ Hz}$), 23.86 (d, $^3J_{\text{CP}} = 3.0 \text{ Hz}$), 23.91 (d, $^3J_{\text{CP}} = 5.25 \text{ Hz}$), 24.05 (d, $^3J_{\text{CP}} = 3.0 \text{ Hz}$), 70.39 (d, $^1J_{\text{CP}} = 158.25 \text{ Hz}$, PCOH), 72.09 (d, $^2J_{\text{CP}} = 7.5 \text{ Hz}$), 72.56 (d, $^2J_{\text{CP}} = 7.5 \text{ Hz}$), 111.37, 118.82 (CN), 127.68, 131.70, 142.63; HRMS: Mass calculated for $\text{C}_{14}\text{H}_{20}\text{NO}_4\text{P}$: 298.2946 (M+H) and (M+Na) 320.2843; Obs. mass 298.2862 (M+H) and 320.2470 (M+Na).

Dimethyl-1-hydroxy-1-(3,4-methylenedioxyphenyl)methylphosphonate, 3t: M. p. = 96-97 °C, ^1H NMR (200 MHz, CDCl_3): $\delta = 3.67$ (d, $^2J_{\text{CP}} = 6 \text{ Hz}$, 3H), 3.72 (d, $^2J_{\text{CP}} = 6 \text{ Hz}$, 3H), 4.94 (d, $^1J_{\text{HP}} = 10 \text{ Hz}$, 1H), 5.95 (s, 2H), 6.77 (d, $J = 7.8 \text{ Hz}$), 6.92 (d, $J = 7.8 \text{ Hz}$), 7.08 (s, 1H), ^{13}C NMR (50 MHz, CDCl_3): $\delta = 53.87, 70.37$ (d, $^1J_{\text{CP}} = 150.63 \text{ Hz}$, CPOH), 101.13 (CH_2), 107.74, 108.16, 120.71, 130.14, 147.15 ppm.

Di-iso-propyl-1-hydroxy-1-(3,4-methylenedioxyphenyl) methyl-phosphonate, 3u:

M.p. = 114-116 °C, IR (KBr): ν = 3263, 2982, 1505, 1225, 993, 523 cm^{-1} , ^1H NMR (300 MHz, CDCl_3): δ = 1.18 (d, J = 6 Hz, 3H), 1.28 (d, J = 6 Hz, 9H), 3.74 (br s, -OH), 4.59-4.71 (m, 2H), 4.85 (d, $^1J_{\text{HP}}$ = 10.2 Hz, 1H), 5.95 (s, 2H), 6.72 (d, J = 8.1 Hz, 1H, ArH), 6.93 (d, J = 7.8 Hz, 1H, ArH), 7.03 (s, 1H, ArH), ^{13}C NMR (75 MHz, CDCl_3): δ = 23.63 (d, $^3J_{\text{CP}}$ = 5.25 Hz), 23.88 (d, $^3J_{\text{CP}}$ = 4.5 Hz), 24.03 (d, $^3J_{\text{CP}}$ = 3.75 Hz), 24.16 (d, $^3J_{\text{CP}}$ = 3.50 Hz), 70.83 (d, $^1J_{\text{CP}}$ = 154.5 Hz, PCOH), 71.71 (d, $^2J_{\text{CP}}$ = 7.5 Hz), 72.03 (d, $^2J_{\text{CP}}$ = 7.5 Hz), 101.02 (CH_2), 107.14, 120.94, 130.54, 147.33, 147.52; HRMS: Mass calculated for $\text{C}_{14}\text{H}_{21}\text{O}_6\text{P}$: 317.2946 (M+H) and (M+Na) 339.2764 ; Obs. mass 317.0837 (M+H) and 339.1026 (M+Na).

Diethyl-1-hydroxy-1-(3,4-dimethoxyphenyl) methylphosphonate, 3v: M. p. 74-76 °C, IR (KBr): ν = 3290, 1243, 1046, 1024 cm^{-1} , ^1H NMR (200 MHz, CDCl_3): δ = 1.19 (t, J = 8 Hz, 3H), 1.25 (t, J = 8 Hz, 3H), 3.84 (s, 6H), 3.98- 4.18 (m, 4H), 4.92 (d, $^1J_{\text{HP}}$ = 10 Hz), 6.81 (d, J = 7.8 Hz, 1H, ArH), 6.99 (d, J = 7.8 Hz, 1H, ArH), 7.06 (s 1H), ^{13}C NMR (75 MHz, CDCl_3): δ = 16.37, 55.72, 63.08, 70.35 (d, $^1J_{\text{CP}}$ = 161.1 Hz, CPOH), 110.39, 110.59, 119.53, 129.07, 148.68, GCMS: m/z = 166 [M^- H- P (O)(OEt) $_2$], 151, 119, 95, 77, 51.

Di-iso-propyl-1-hydroxy-1-(3,4-dimethoxyphenyl) methylphosphonate, 3w: M. p. = 80-81 °C, IR (KBr): ν = 3437, 2978, 1610, 1518, 1383, 1239, 1029, 737, 559 cm^{-1} , ^1H NMR (300 MHz, CDCl_3): δ = 1.15 (d, J = 6.3 Hz, 3H), 1.27 (d, J = 6.0 Hz, 9H), 3.11 (br s, -OH), 3.88 (s, OCH_3), 3.95 (s, OCH_3), 4.55 - 4.70 (m, 2H), 4.88 (d, $^1J_{\text{HP}}$ = 10.2 Hz, 1H), 6.83 (d, J = 8 Hz, 1H, ArH), 7.00 (m, 1H, ArH), 7.10 (t, J = 7.8 Hz, 1H, ArH), ^{13}C NMR (75 MHz, CDCl_3): δ = 23.65 (d, $^3J_{\text{CP}}$ = 5.25 Hz), 23.91 (d, $^3J_{\text{CP}}$ = 4.50 Hz), 24.10 (d, $^3J_{\text{CP}}$ = 3.75 Hz), 24.19 (d, $^3J_{\text{CP}}$ = 3.0 Hz), 55.83 (OCH_3), 56.09 (OCH_3), 70.83 ($^1J_{\text{CP}}$ =

161.25 Hz, CPOH), 71.65 ($^2J_{CP} = 7.5$ Hz), 71.90 ($^2J_{CP} = 7.5$ Hz), 110.45, 110.68, 119.86, 129.08, 148.70, 148.80; HRMS: Mass calculated for $C_{15}H_{25}O_6P$: 333.3371(M+H) and (M+Na) 355.3189; Obs. Mass 333.1432 (M+H) and 355.1386 (M+Na).

Diethyl-1-hydroxy-1-(4-allyloxyphenyl) methylphosphonate, 3x: M.p. = 64-65 $^{\circ}C$, IR (KBr): $\nu = 3219, 1617, 1507, 1376, 1210, 1050, 995$ cm^{-1} , 1H NMR (200 MHz, $CDCl_3$): $\delta = 1.20$ (t, $J = 7.8$ Hz, 3H), 1.28 (t, $J = 7.8$ Hz, 3H), 2.2 (br s, OH), 3.9-4.2 (m, 4H), 4.52 (d, $J = 6$ Hz, 2H), 4.87 (d, $^1J_{HP} = 10.2$ Hz, 1H), 5.30 (d, $J = 17$ Hz, 1H), 5.37 (dd, $J = 17$ & 2 Hz, 1H), 5.9-6.3 (m, 1H), 7.00 (d, $J = 8$ Hz, 2H), 7.39 (d, $J = 8$ Hz, 2H), ^{13}C NMR (50 MHz, $CDCl_3$): $\delta = 16.20, 62.40, 68.24$ (OCH₂), 70.18 (d, $^1J_{CP} = 154$ Hz, PCOH), 114.32, 117.54, 128.32, 128.78, 130.04, 158.33, GCMS: $m/z = 162$ [M - H - P(O)(OEt)₂], 121, 77, 65.

Di-iso-propyl-1-hydroxy-1-(4-allyloxyphenyl) methylphosphonate, 3y: M.p. = 74-76 $^{\circ}C$, IR (KBr): $\nu = 3219, 2979, 1610, 1511, 1386, 1210, 1050, 995, 838, 568$ cm^{-1} , 1H NMR (300 MHz, $CDCl_3$): $\delta = 1.13$ (d, $J = 6.3$ Hz, 3H) 1.26 (d, $J = 6.3$ Hz, 9H), 3.28 (br s, -OH), 4.52 (d, $J = 2.7$ Hz, 2H) 4.54-4.68 (m, 2H), 4.87 (d, $^1J_{HP} = 10.2$ Hz, 1H), 5.27 (dd, $J = 10.5$ Hz & 1.5 Hz, 1H), 5.40 (dd, $J = 17.1$ & 1.5 Hz, 1H), 5.98-6.11 (m, 1H), 6.89 (d, $J = 8.7$ Hz, 2H, ArH) 7.40 (d, $J = 8.7$ Hz, 2H), ^{13}C NMR (75 MHz, $CDCl_3$): $\delta = 23.58$ (d, $^3J_{CP} = 5.25$ Hz), 23.87 (d, $^3J_{CP} = 4.5$ Hz), 24.06 (d, $^3J_{CP} = 3.0$ Hz), 24.16 (d, $^3J_{CP} = 3.0$ Hz), 68.78 (OCH₂), 70.55 (d, $^1J_{CP} = 144.75$ Hz, PCOH), 71.68 (d, $^2J_{CP} = 8.0$ Hz), 71.74 (d, $^2J_{CP} = 7.5$ Hz), 114.43, 117.62, 128.54, 128.62, 128.98, 133.18, 158.41; HRMS: Mass calculated for $C_{16}H_{25}O_5P$: 329.3484 (M+H) and 351.3302 (M+Na); Obs. Mass 329.3671 (M+H) and 351.3886 (M+Na).

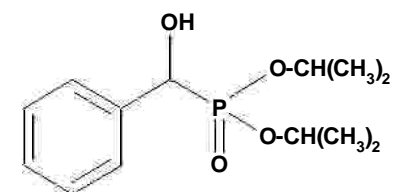
Diethyl-1-hydroxy-1-(4-benzyloxyphenyl) methylphosphonate, 3z: M.p. = 94-95 $^{\circ}C$,

IR (KBr): $\nu = 3397, 2984, 1386, 1231, 986 \text{ cm}^{-1}$, $^1\text{H NMR}$ (200 MHz, CDCl_3): $\delta = 1.21$ (t, $J = 7.8 \text{ Hz}$, 3H), 1.26 (t, $J = 7.8 \text{ Hz}$, 3H), 3.9-4.2 (m, 4H), 4.95 (d, $^1J_{\text{HP}} = 10.4 \text{ Hz}$, 1H), 5.60 (s, 2H), 6.97 (d, $J = 8 \text{ Hz}$, 2H, ArHs), 7.31(m, 5H) 7.39 (d, $J = 8 \text{ Hz}$, 2H, ArHs), $^{13}\text{C NMR}$ (50 MHz, CDCl_3): $\delta = 16.20, 63.02, 69.80, 70.08$ (d, $^1J_{\text{CP}} = 160.5 \text{ Hz}$, PCOH), 114.44, 127.31, 128.40, 127.87, 129.10, 136.74, 158.47, GCMS: $m/z = 350$ (M^+ , weak) 252, 207, 91.

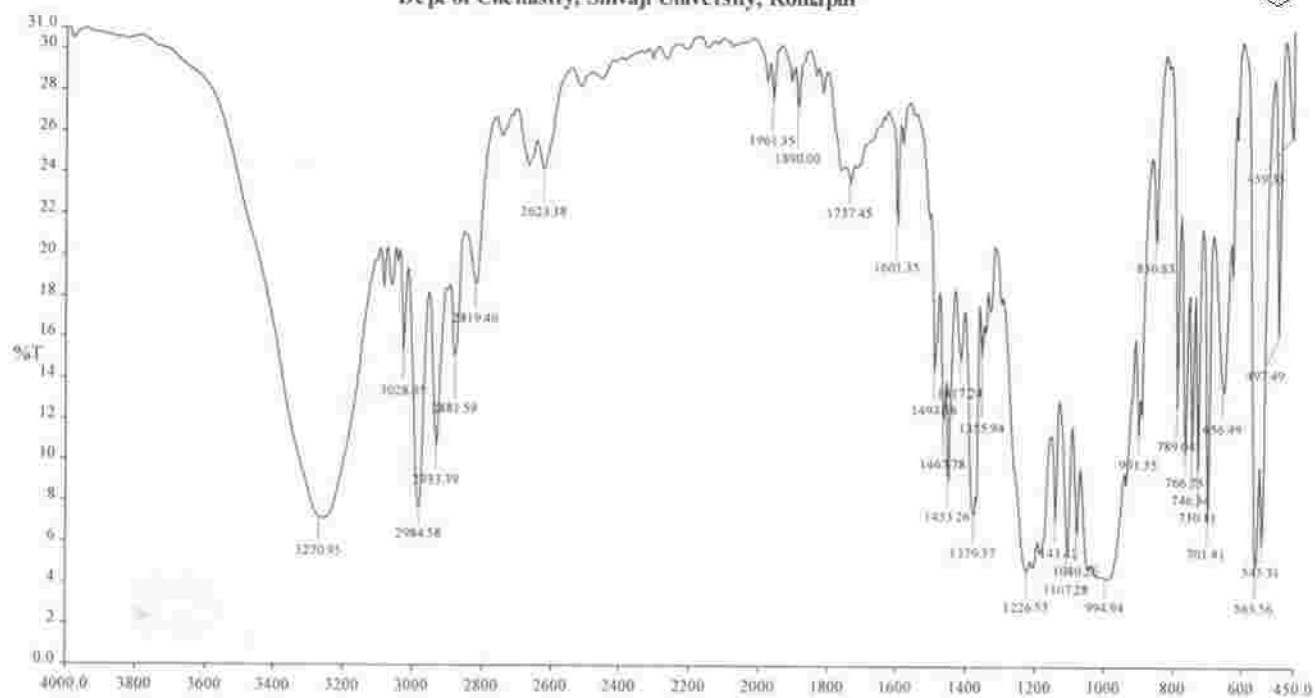
Di-iso-propyl-1-hydroxy-1-(4-benzyloxyphenyl) methylphosphonate, 3za: M.p.=108-110 $^{\circ}\text{C}$; IR (KBr): $\nu = 3413, 2980, 1608, 1513, 1387, 1235, 1026, 735, 554 \text{ cm}^{-1}$, $^1\text{H NMR}$ (300 MHz, CDCl_3): $\delta = 1.13$ (d, $J = 6.3 \text{ Hz}$, 3H) 1.28 (d, $J = 6.0 \text{ Hz}$, 9H), 3.08 (br s, -OH), 4.57-4.68 (m, 2H) 4.90 (d, $^1J_{\text{HP}} = 9.9 \text{ Hz}$, 1H), 5.12 (s, 2H), 6.96 (d, $J = 8.7 \text{ Hz}$, 2H, ArHs) 7.30-7.87 (m, 7H, ArHs), $^{13}\text{C NMR}$ (75 MHz, CDCl_3): $\delta = 23.60$ (d, $^3J_{\text{CP}} = 6.0 \text{ Hz}$), 23.87 (d, $^3J_{\text{CP}} = 5.25 \text{ Hz}$), 24.07 (d, $^3J_{\text{CP}} = 3.75 \text{ Hz}$), 24.17 (d, $^3J_{\text{CP}} = 3.0 \text{ Hz}$), 69.79 (OCH₂), 70.42 (d, $^1J_{\text{CP}} = 151.5 \text{ Hz}$), 71.75 (d, $^2J_{\text{CP}} = 7.5 \text{ Hz}$), 71.94 (d, $^2J_{\text{CP}} = 7.5 \text{ Hz}$), 114.62, 115.15, 127.45, 127.94, 128.55, 128.63, 128.72, 128.95, 128.98, 136.90, 158.61, 158.65; HRMS: Mass calculated for $\text{C}_{20}\text{H}_{27}\text{O}_5\text{P}$: 379.4070 (M+H) and 401.3888 (M+Na); Obs. Mass: 379.5342 (M+H) and 401.3671 (M+Na).

Di-iso-propyl-1-hydroxy-2-(thiophenyl) methylphosphonate, 3zc: M.p. = 64-66 $^{\circ}\text{C}$, IR (KBr): $\nu = 3245, 2984, 1386, 1231, 986, 704, 555 \text{ cm}^{-1}$, $^1\text{H NMR}$ (300 MHz, CDCl_3): $\delta = 1.19$ (d, $J = 6.3 \text{ Hz}$, 3H), 1.31 (d, $J = 6.3 \text{ Hz}$, 9H), 3.59 (br s, -OH), 4.67 - 4.74 (m, 2H), 5.16 (d, $^1J_{\text{HP}} = 10.8 \text{ Hz}$, 1H), 6.99 (t, $J = 4.1 \text{ Hz}$, 1H), 7.18 (t, $J = 3.8 \text{ Hz}$, 1H), 7.28 (1H, dd, $J = 4.0 \text{ Hz}$ and 1.2 Hz), $^{13}\text{C NMR}$ (75 MHz, CDCl_3): $\delta = 23.58$ (d, $^3J_{\text{CP}} = 5.25 \text{ Hz}$), 23.86 (d, $^3J_{\text{CP}} = 4.5 \text{ Hz}$), 24.03 (d, $^3J_{\text{CP}} = 3.75 \text{ Hz}$), 24.18 (d, $^3J_{\text{CP}} = 3.00 \text{ Hz}$), 67.24 (d, $^1J_{\text{CP}} = 166.5 \text{ Hz}$, PCOH), 72.05 (d, $^2J_{\text{CP}} = 3.75 \text{ Hz}$), 72.44 ($^2J_{\text{CP}} = 3.75 \text{ Hz}$), 125.49, 126.09, 126.66, 139.22, HRMS: Mass calculated for $\text{C}_{11}\text{H}_{19}\text{O}_4\text{PS}$: 279.3128 (M+H); Obs. Mass: 279.0441 (M+H)

α -Hydroxy Phosphonates



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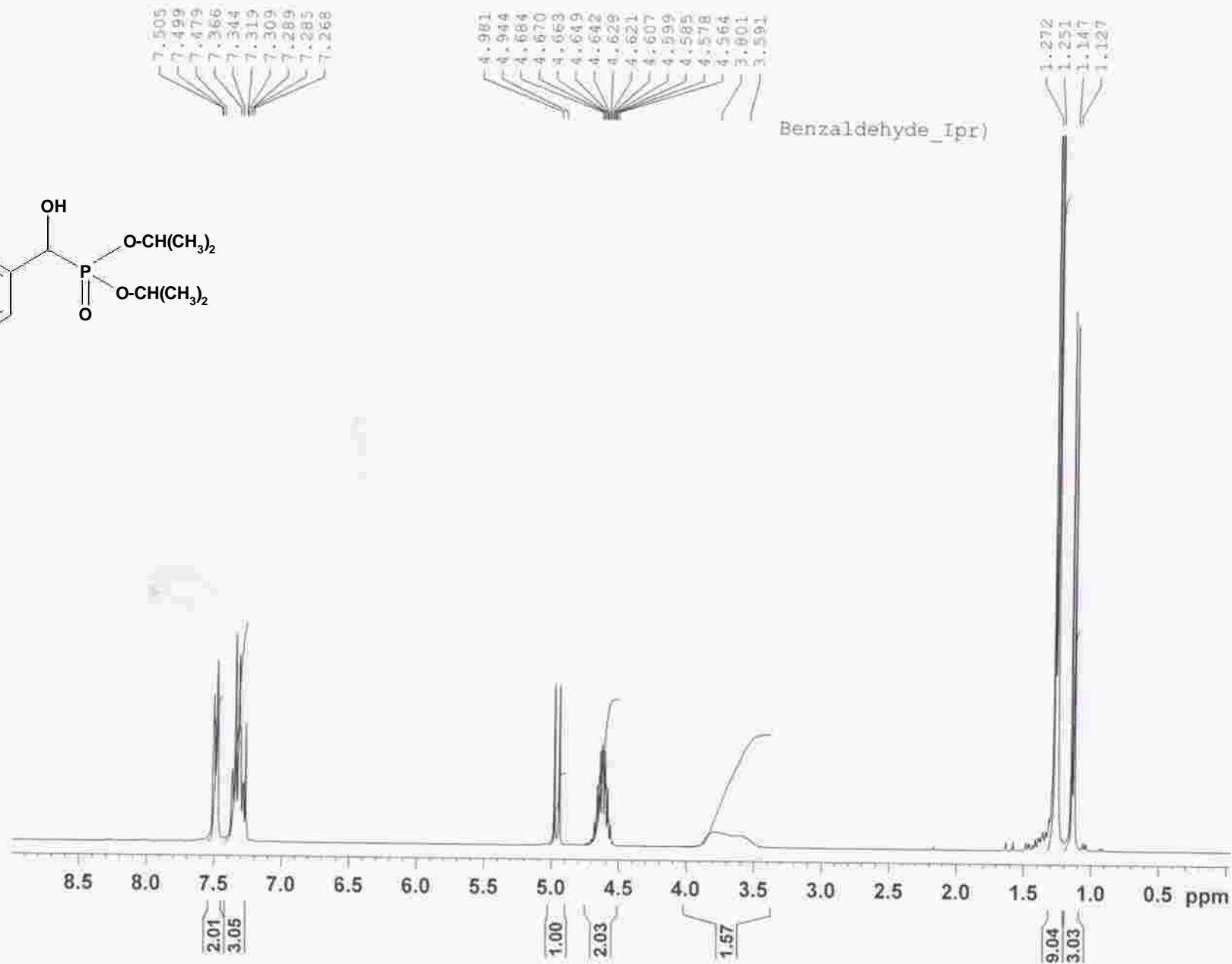
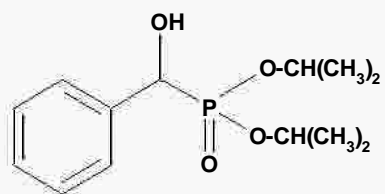


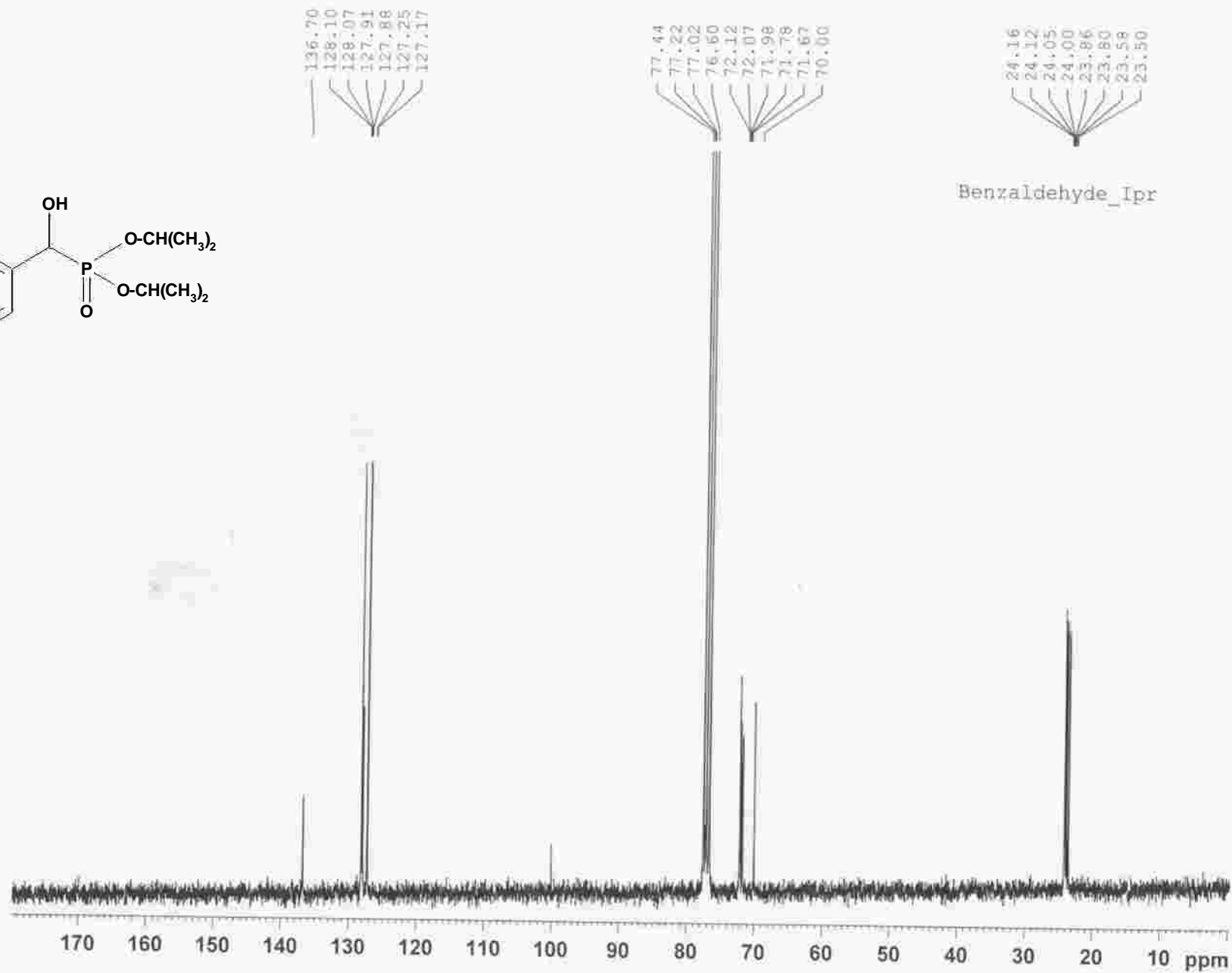
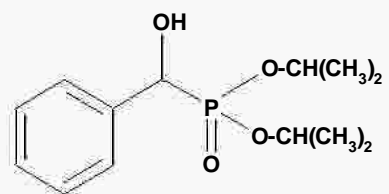
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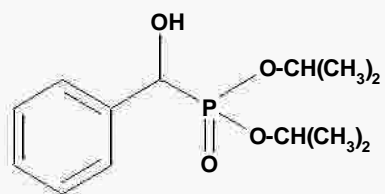
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ANALYSIS:
cm-1





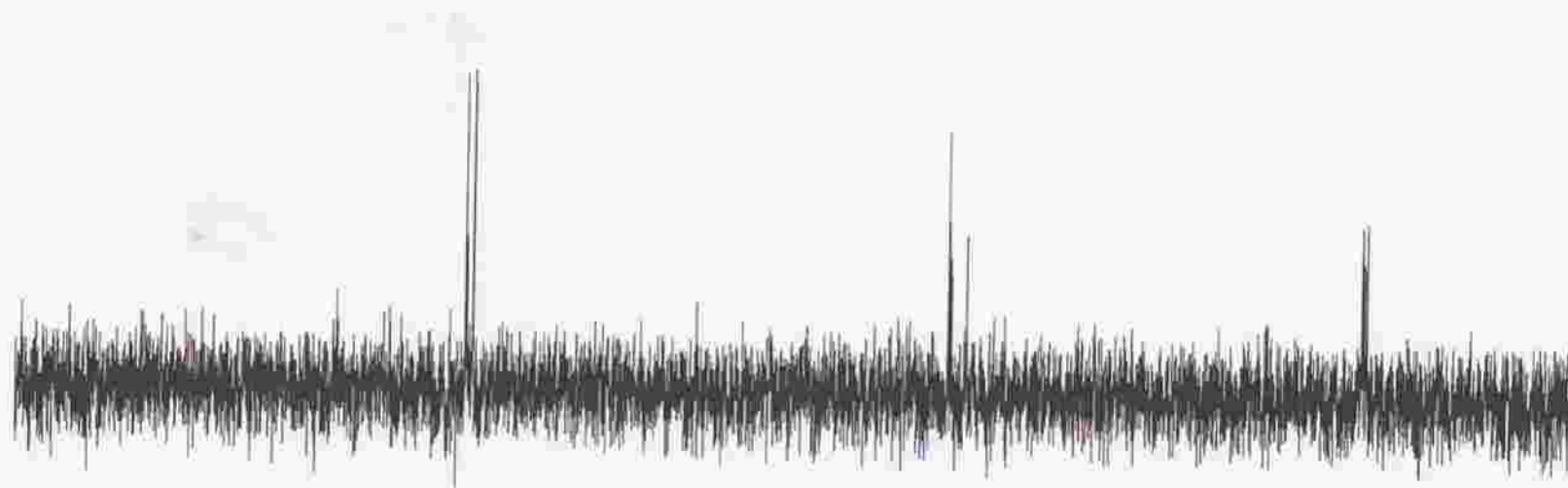


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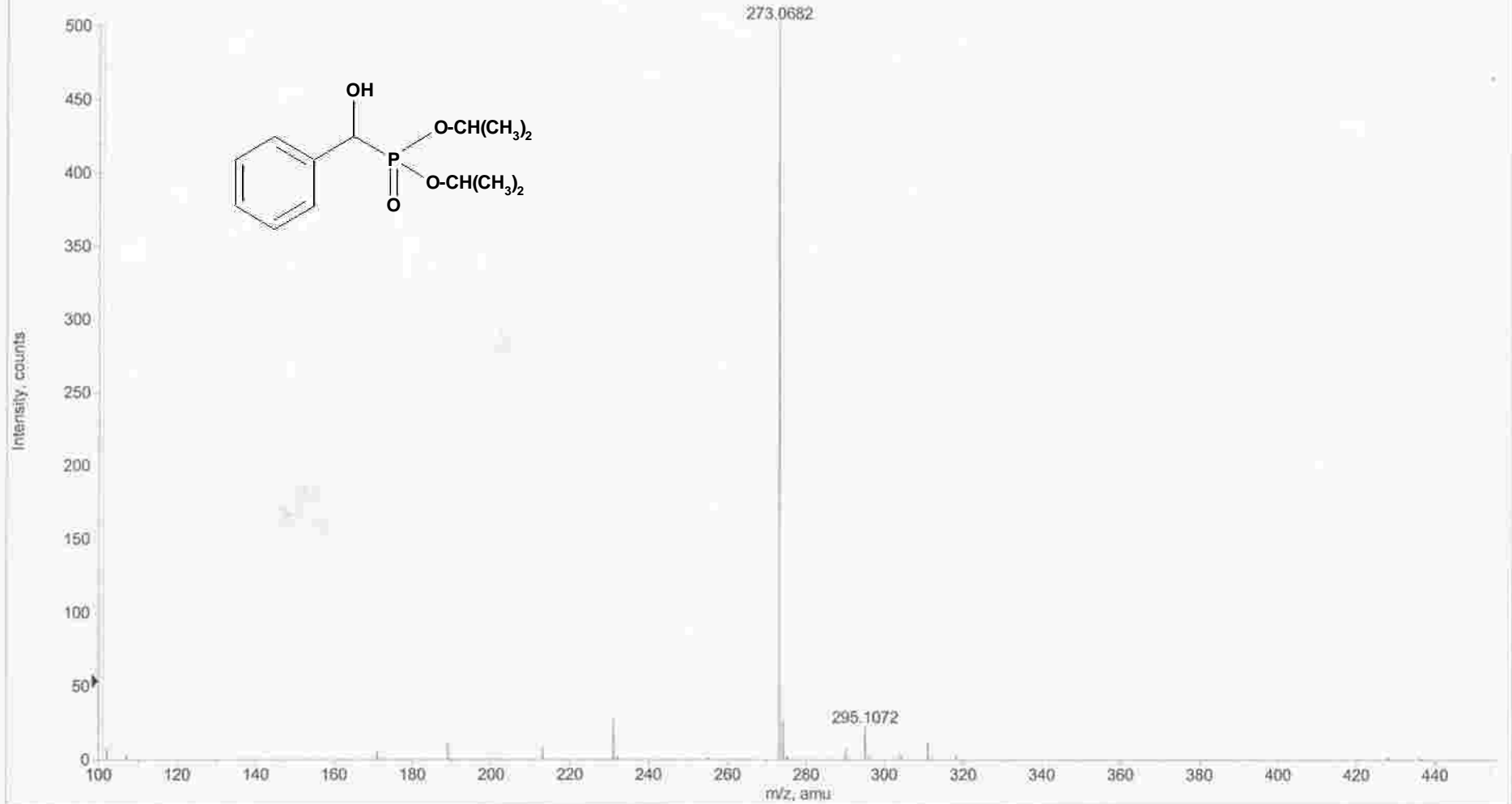
Benzaldehyde_Ipr



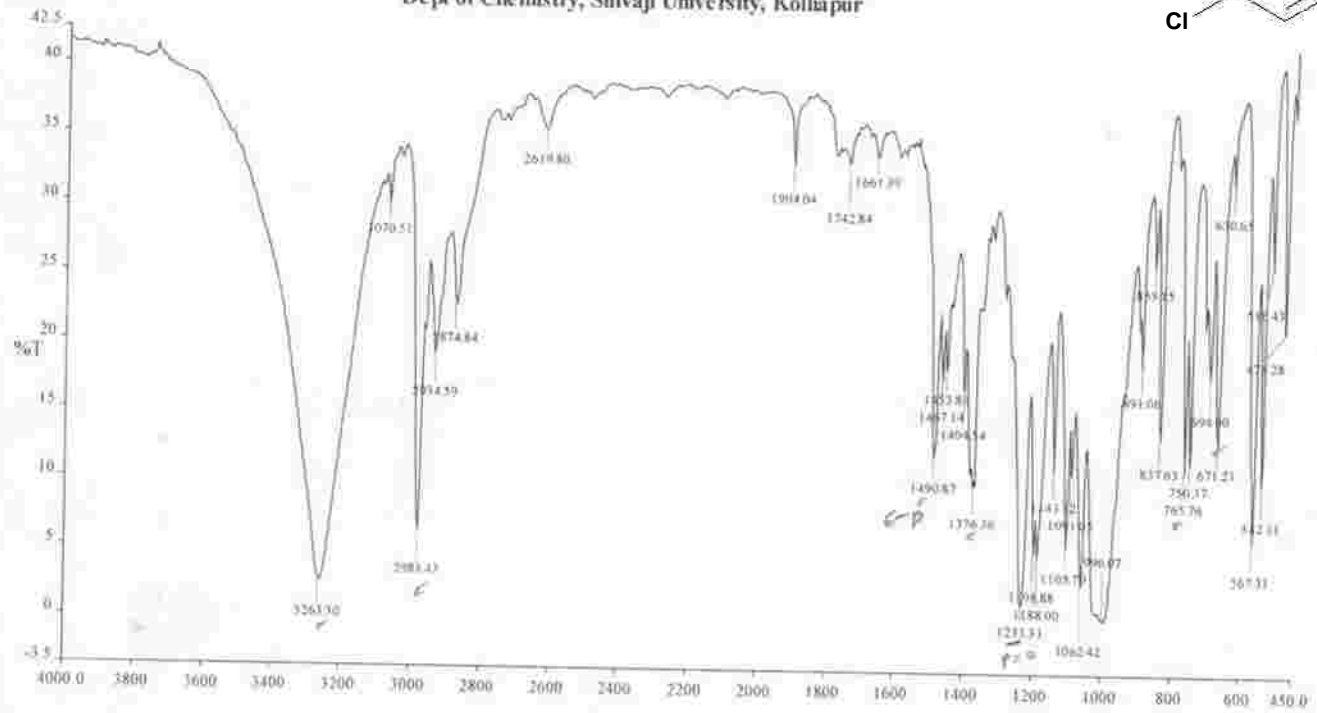
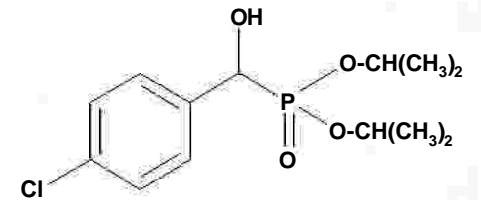
170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

+TOF MS: 0.017 to 0.483 min from BENZ_DIPR.wiff
 a=3.37719425928799980e-004, t0=-3.54887063182468410e+001

Max: 538.2 counts



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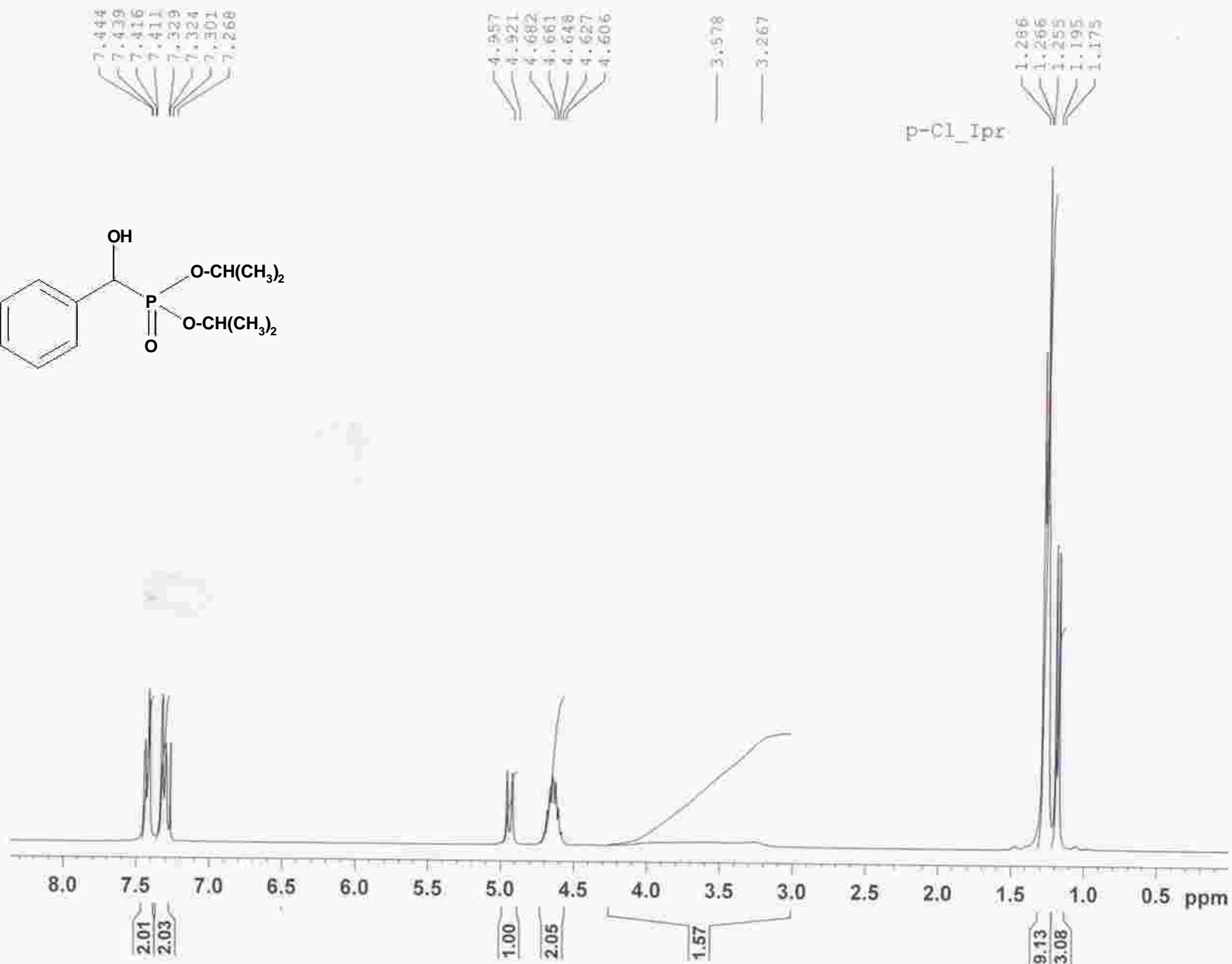
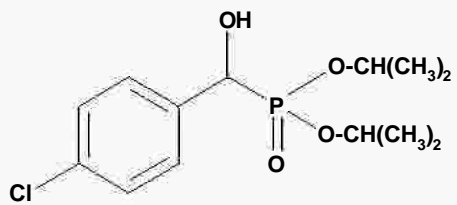
INSTRUMENT MODEL: PERKIN ELMER SPECTRUM 100.
Instrument Serial Number: 79720

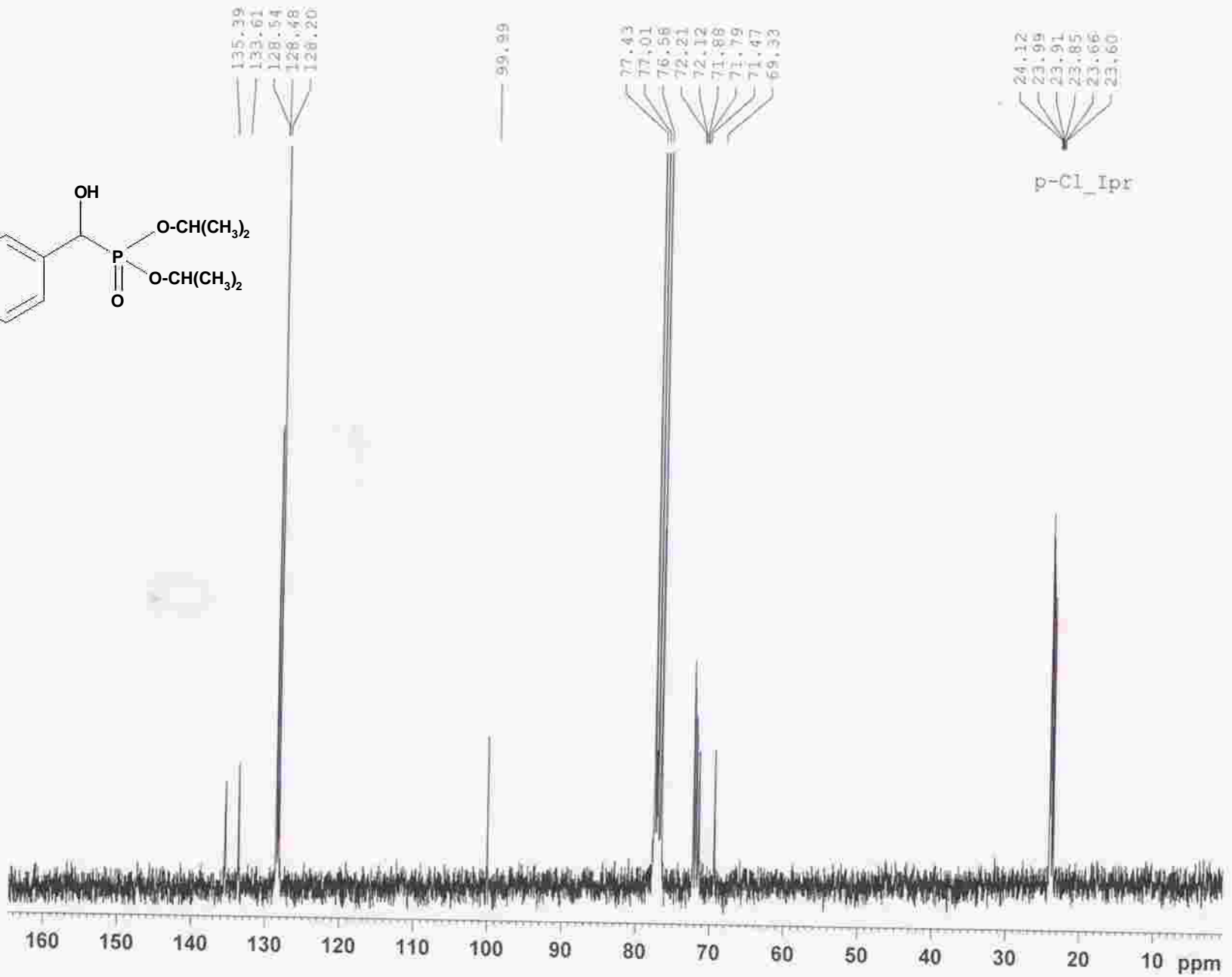
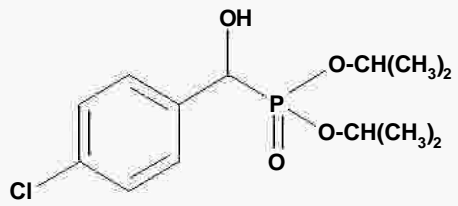
1pr-2.002 - 23-09-10

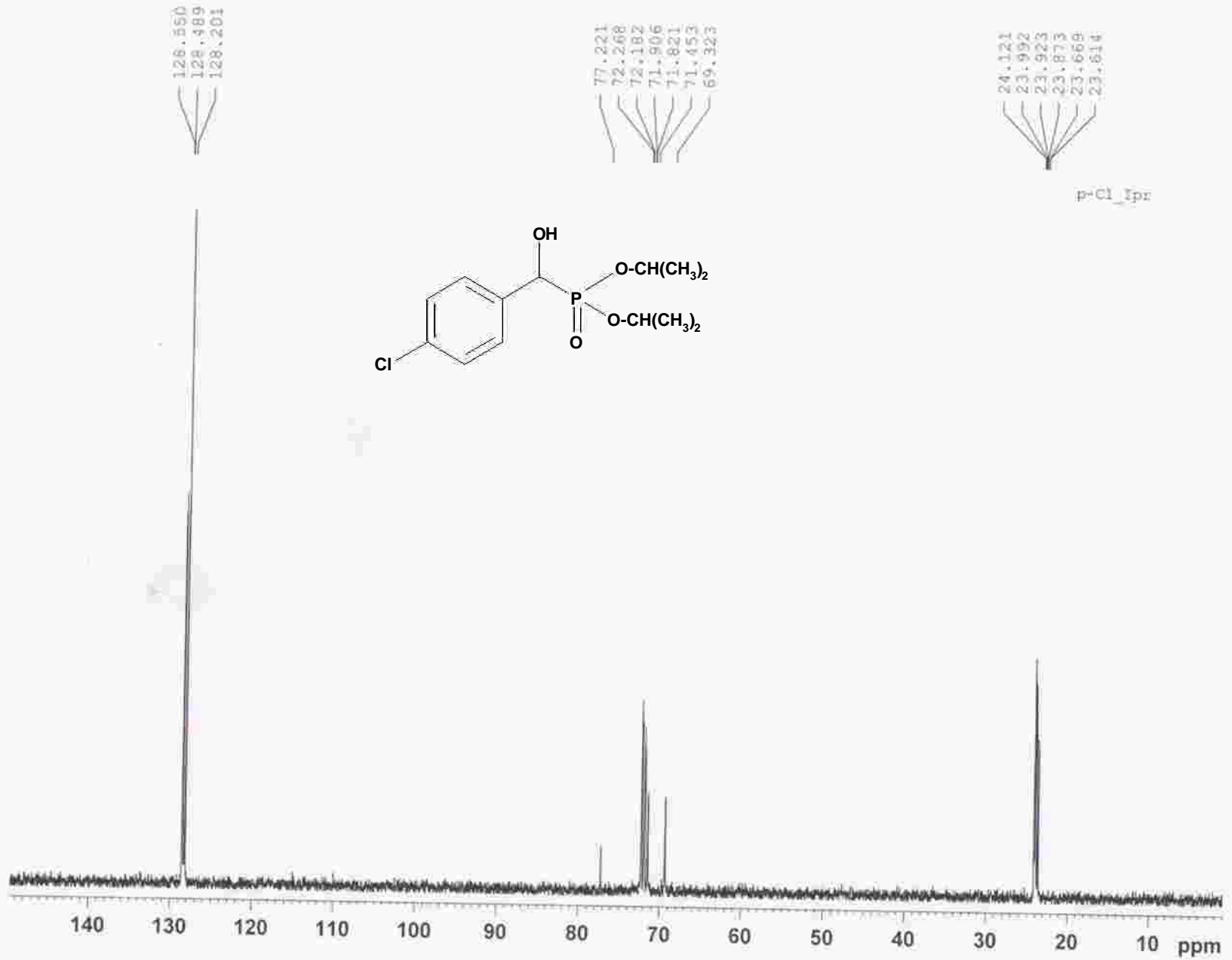
Date Created: 23 September, 2010 3:57 PM India Standard Time

ANALYSIS:

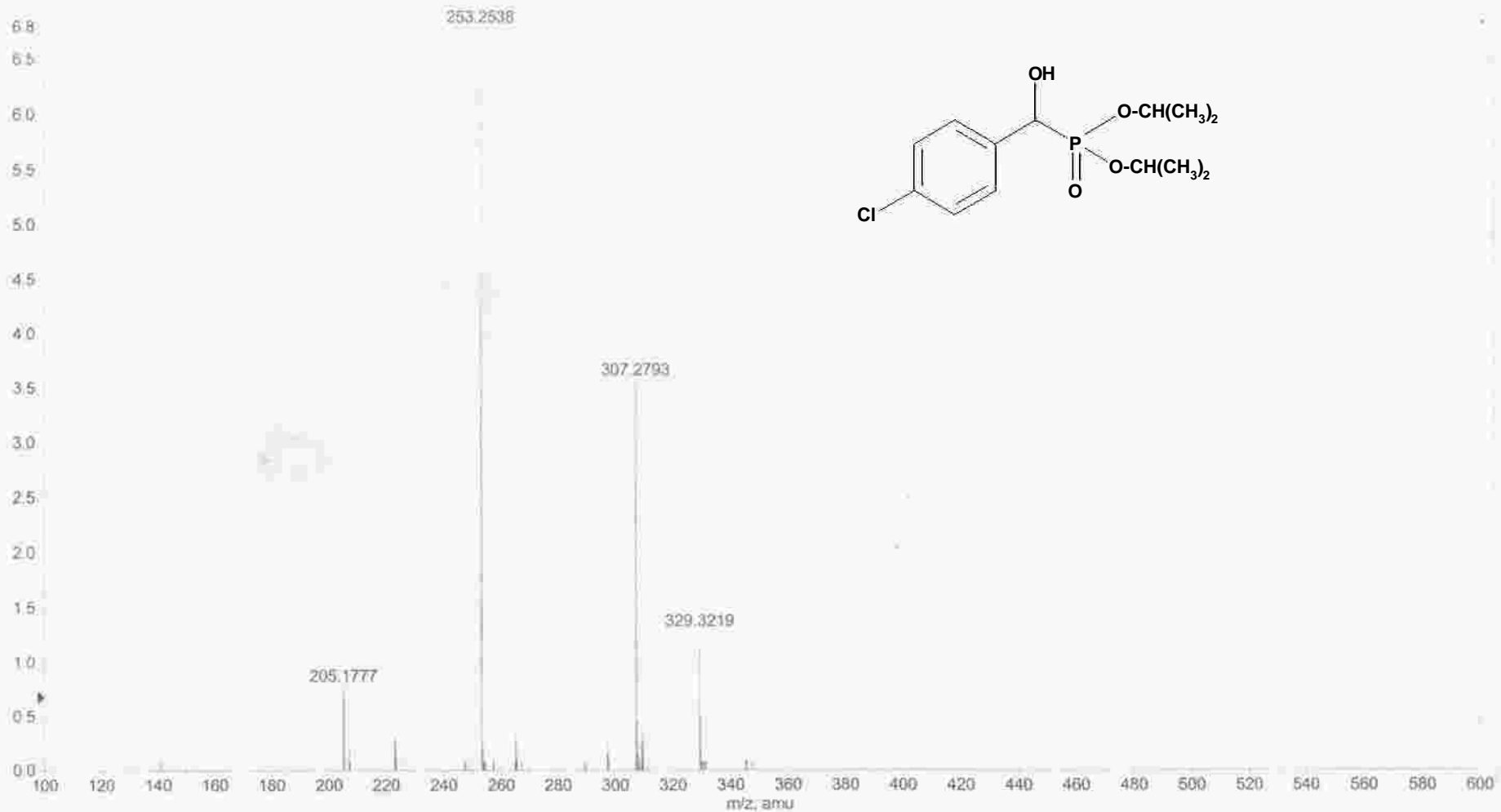
cm-1

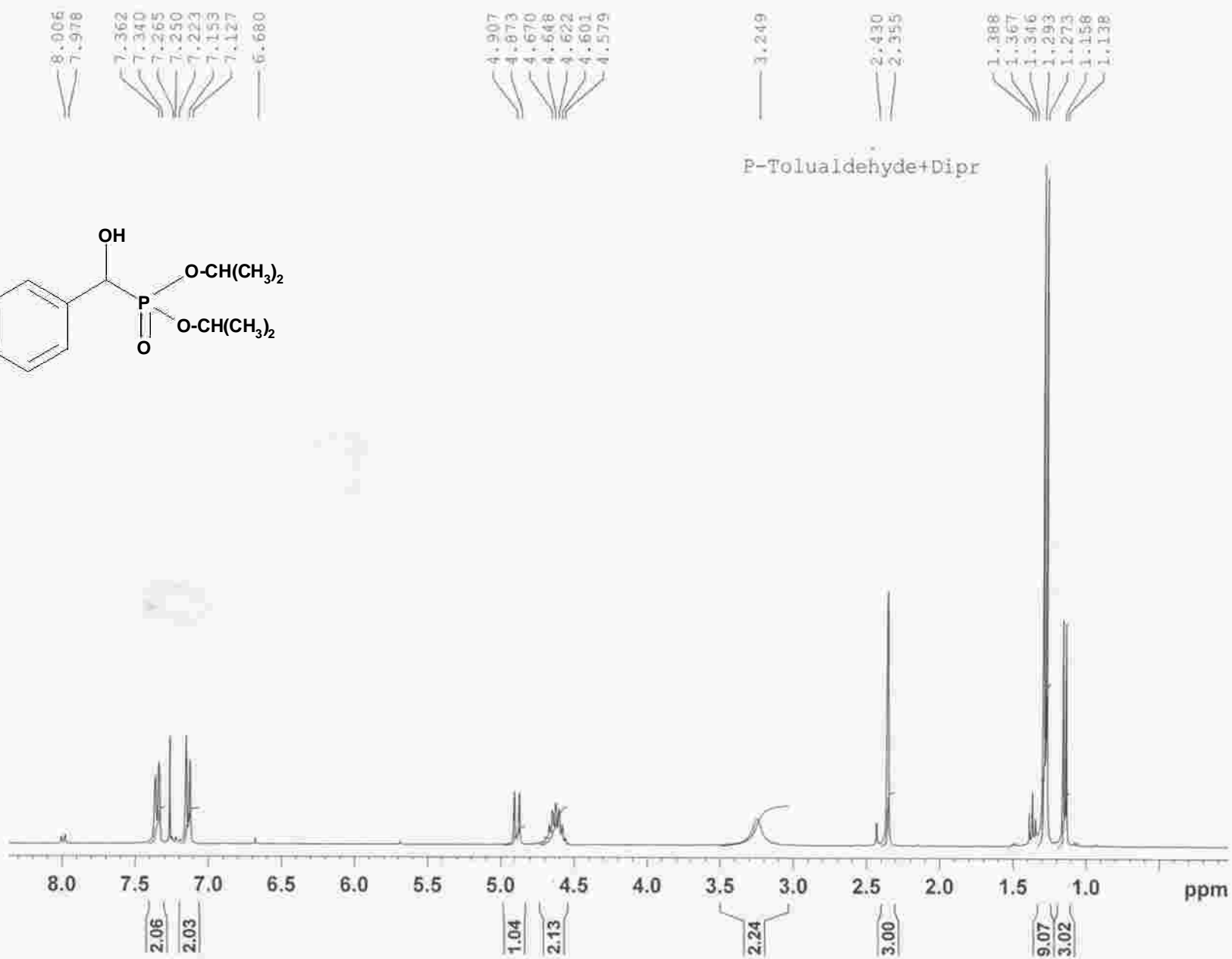
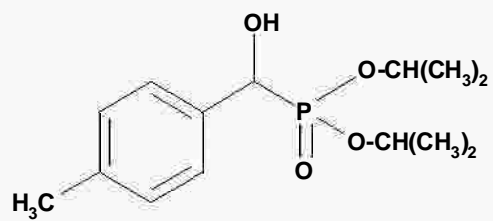


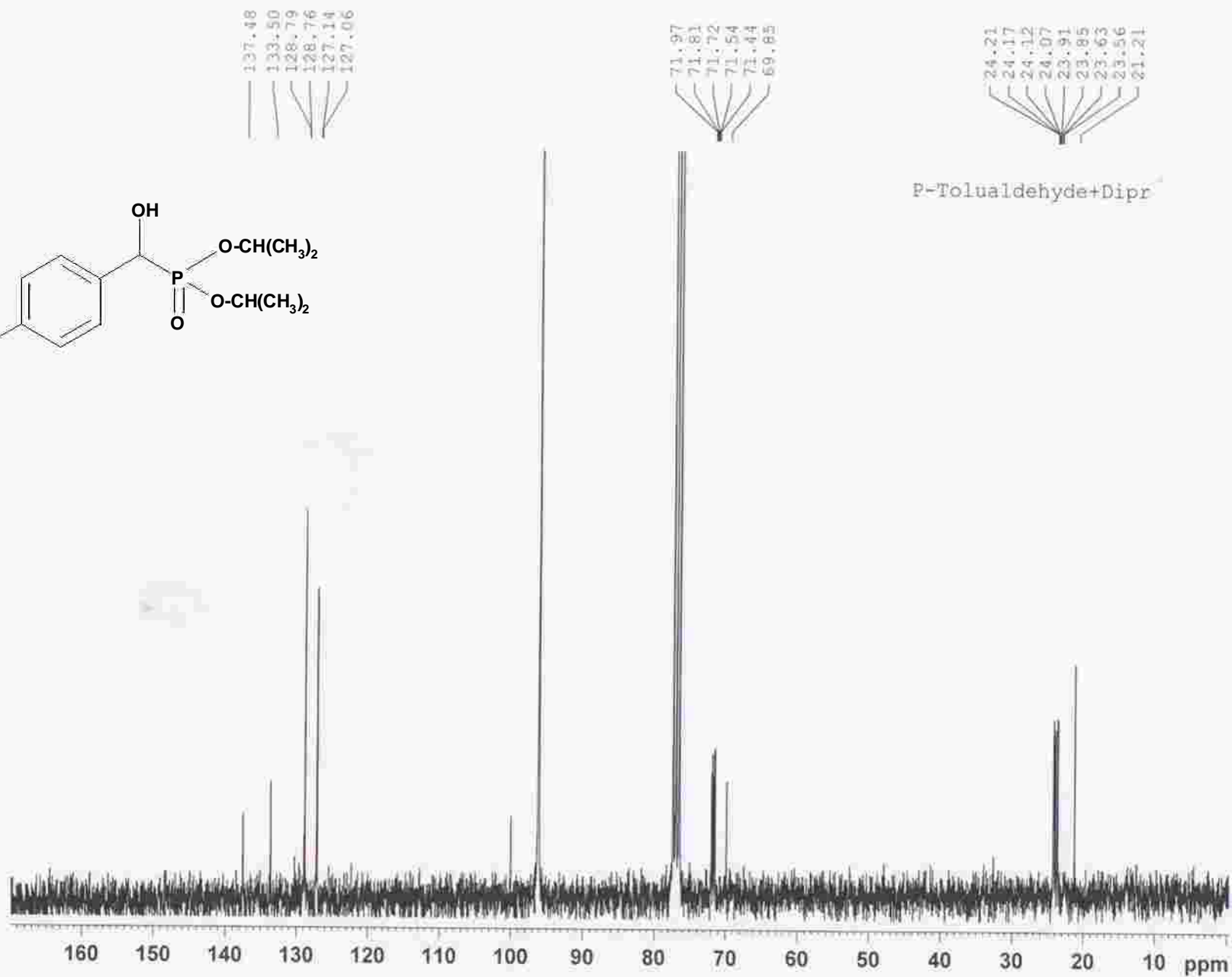
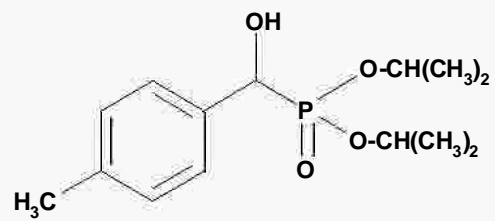




a=3.31839173977164490e-004; t0=-3.49418653411422530e+001



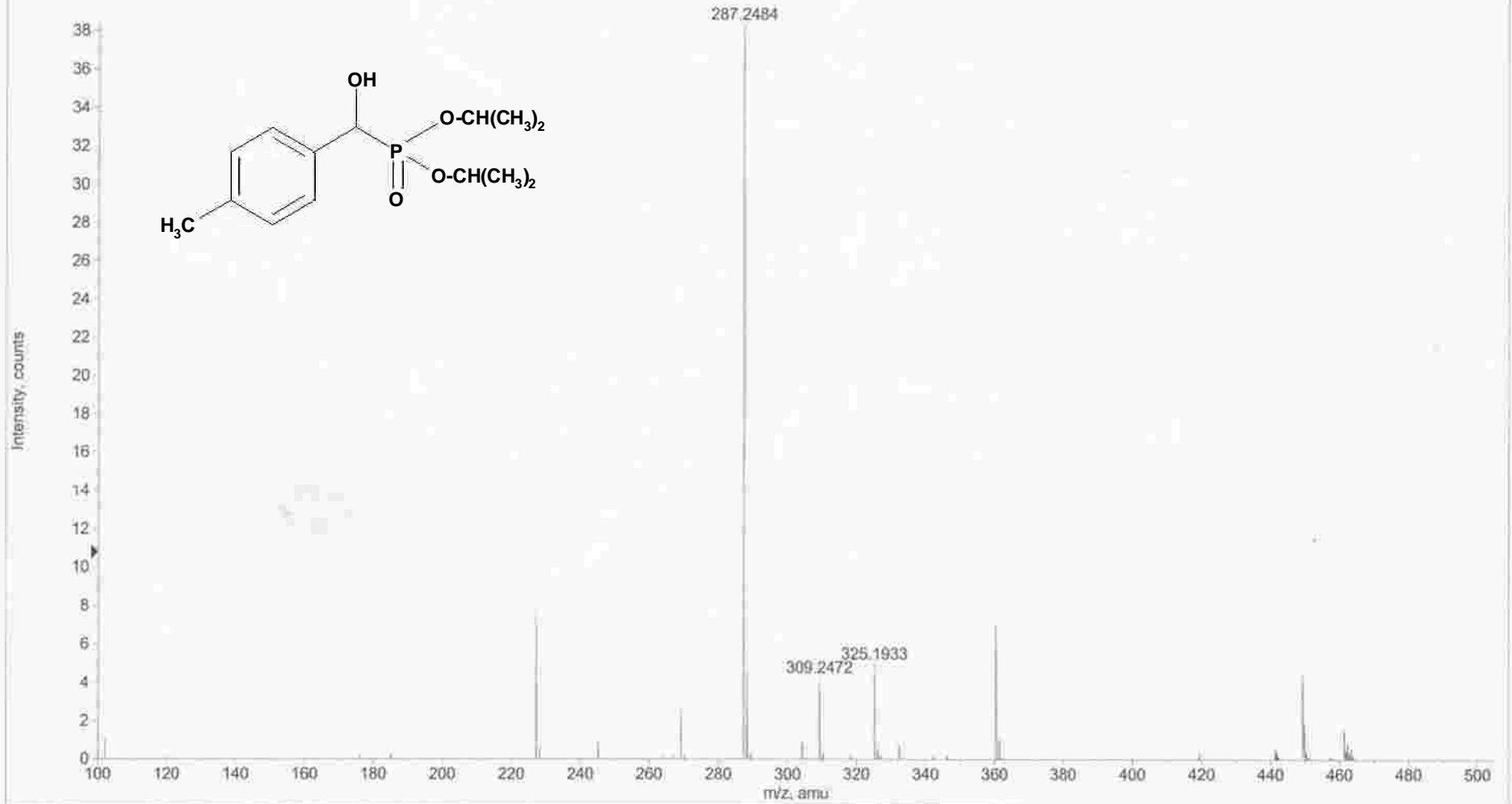




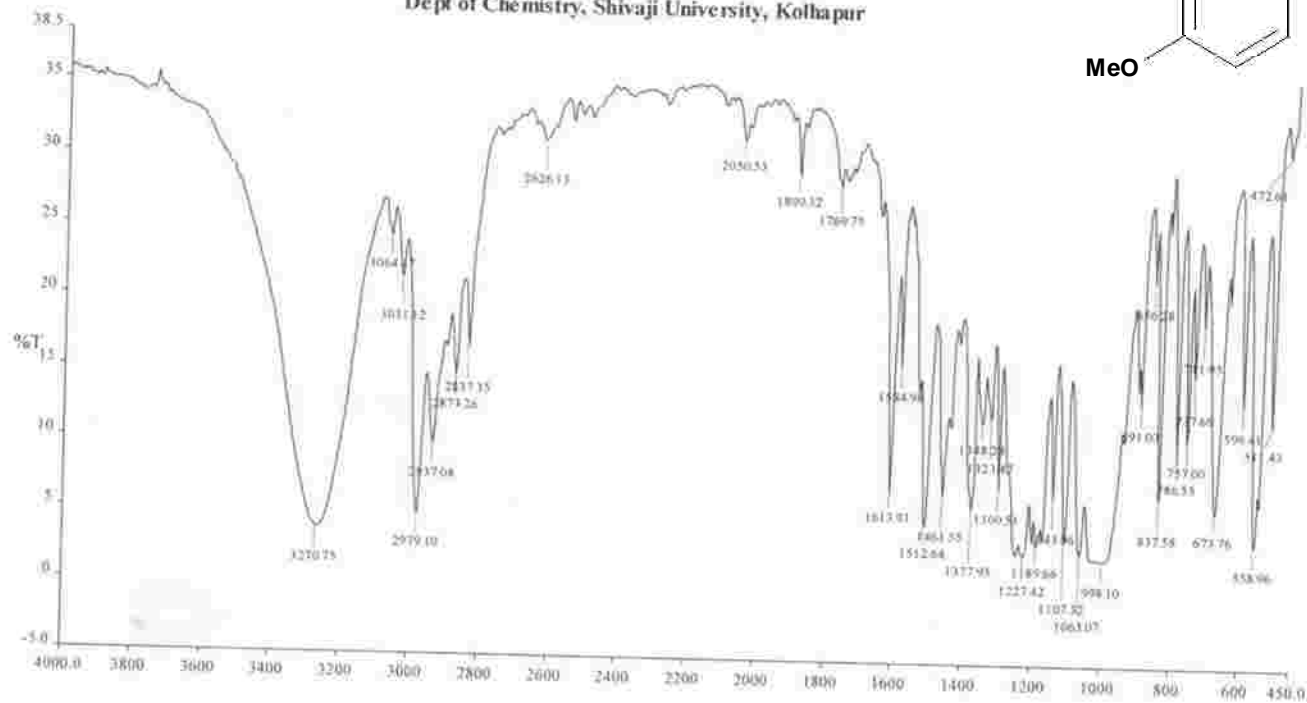
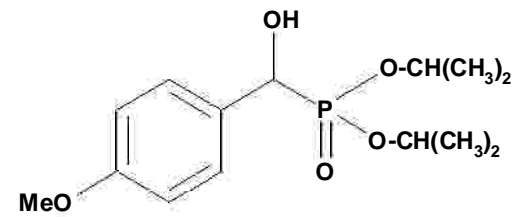
P-Tolualdehyde+Dipr

+TOF MS: 0.033 to 1.200 min from P-TOLDIHYDE-IPR.wiff
a=3.37719425928799980e-004, 10=-3.54887063182468410e+001 R;

Max. 107.8 counts



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INSTRUMENT MODEL: PERKIN ELMER SPECTRUM 100.

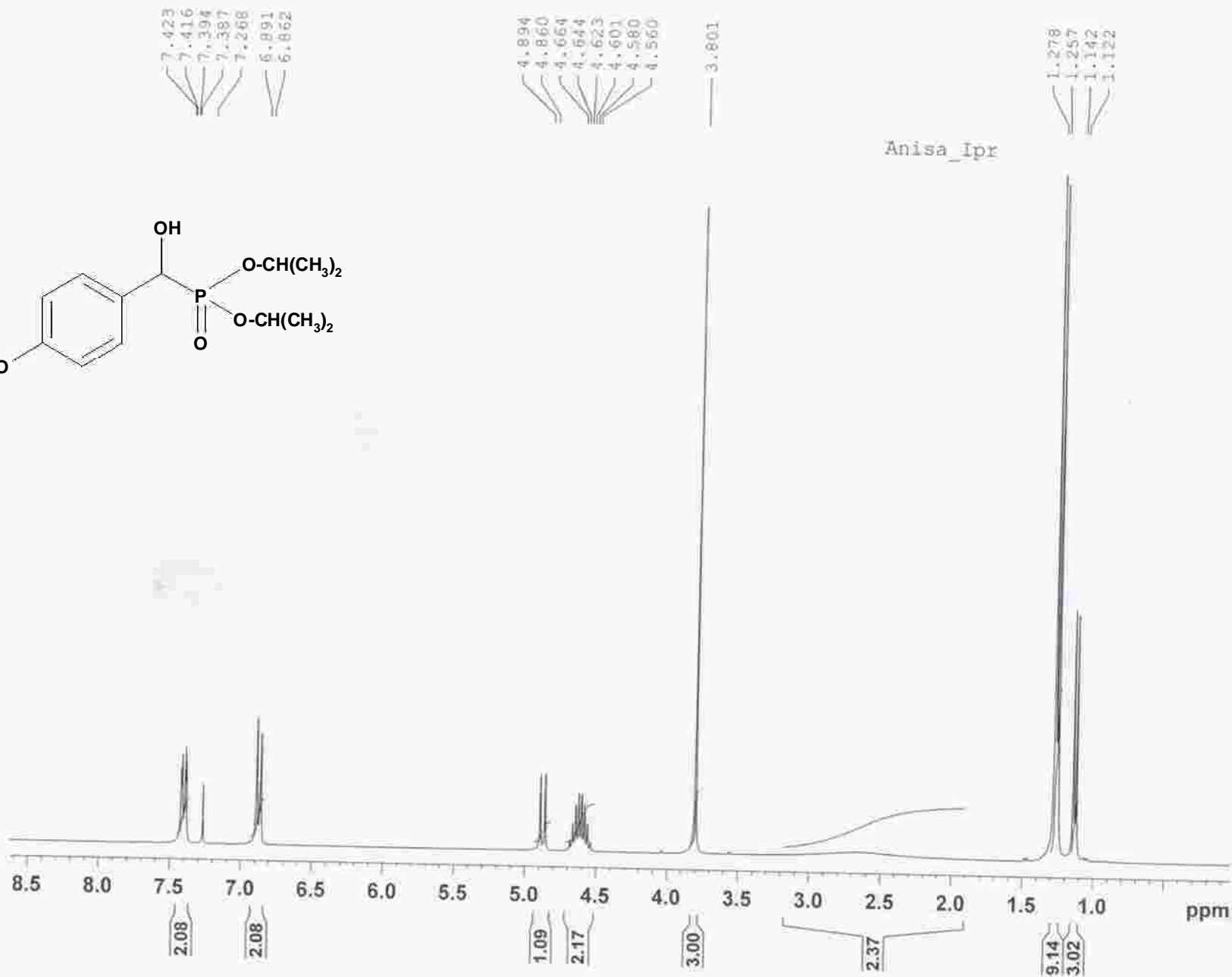
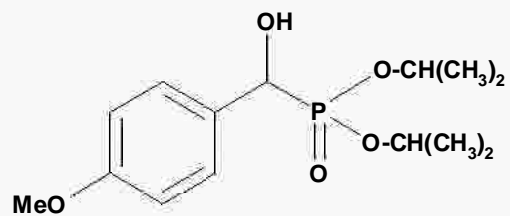
Instrument Serial Number: 79720.

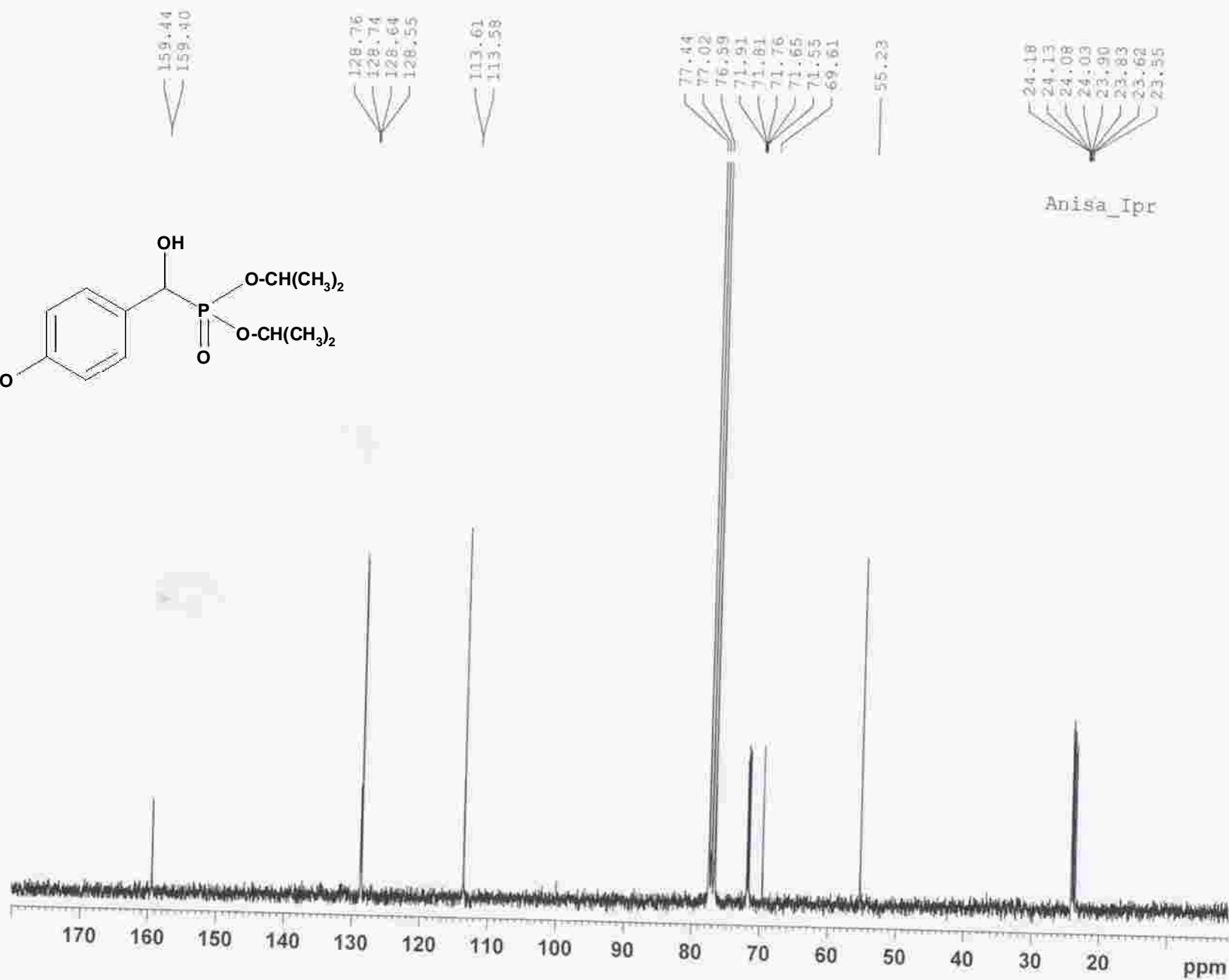
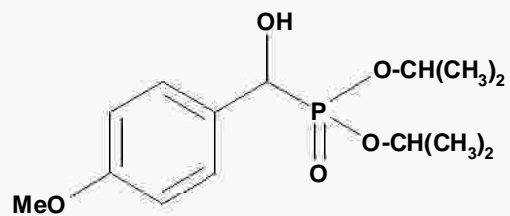
lpr-7.002 - 23-09-10.

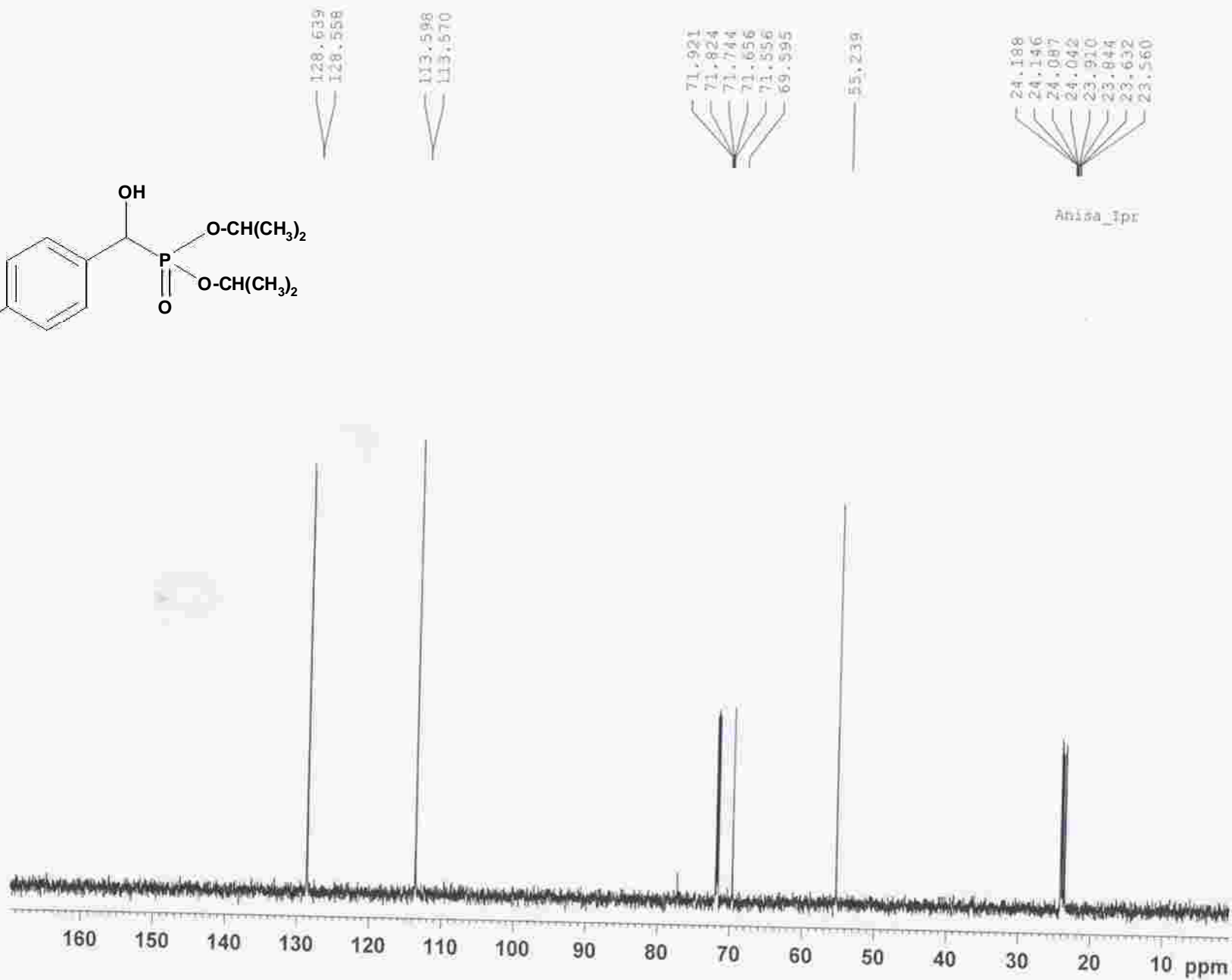
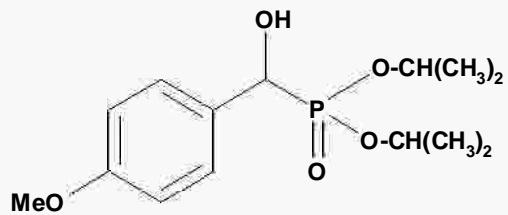
Date Created: 23 September, 2010 5:46 PM India Standard Time

ANALY 7:

cm-1





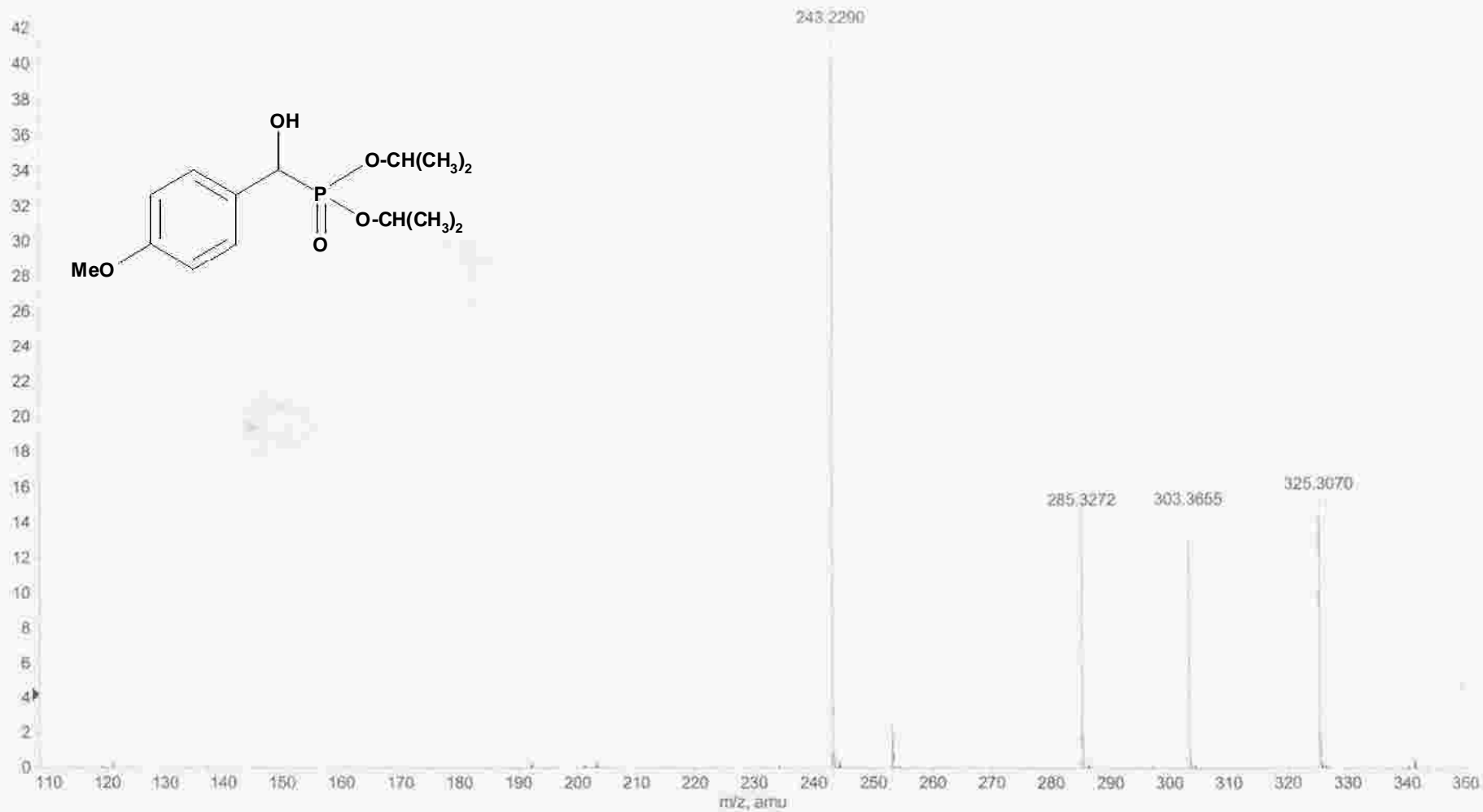


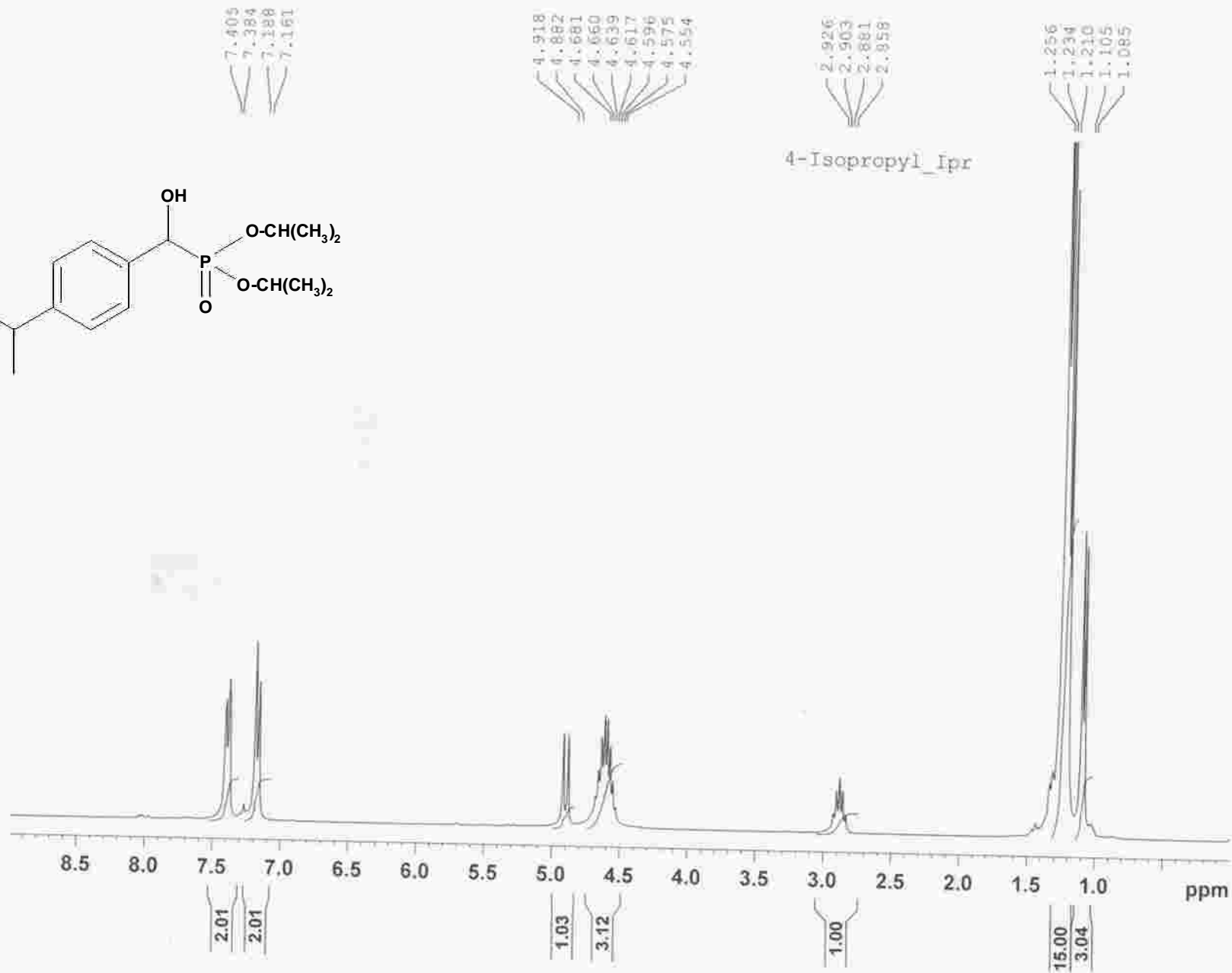
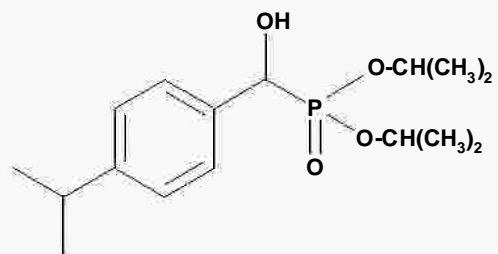
Hydrolysis of PPR-7

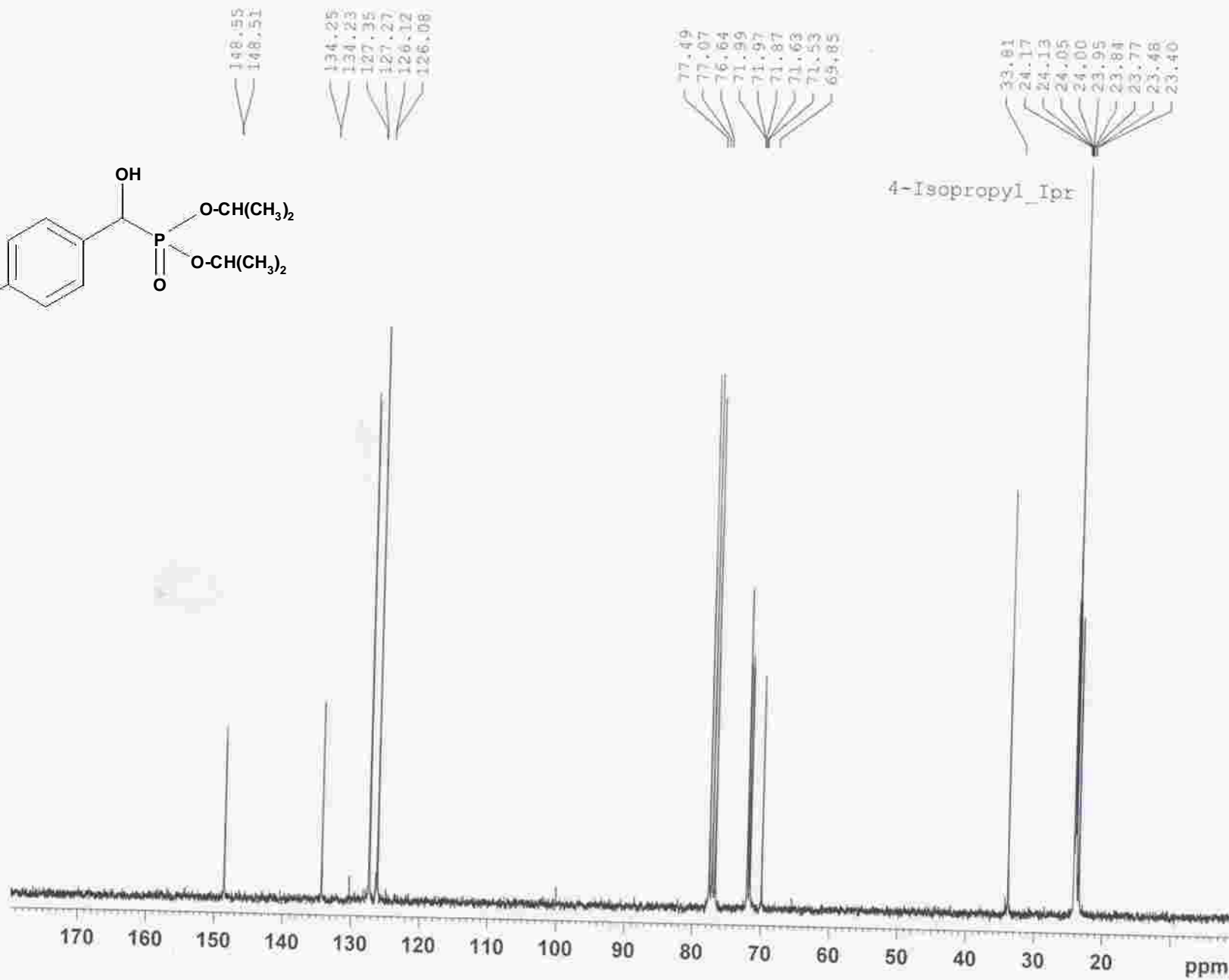
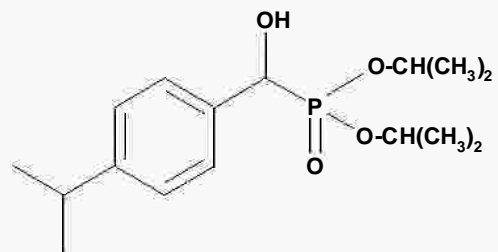
Pr-7

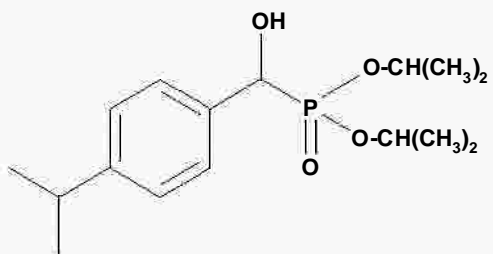
+TOF MS: 0.050 to 0.300 min from IPR-7 wiff
a=3.31839173977164490e-004, t0=3.49418683411422530e+001

Max. 42.1 counts







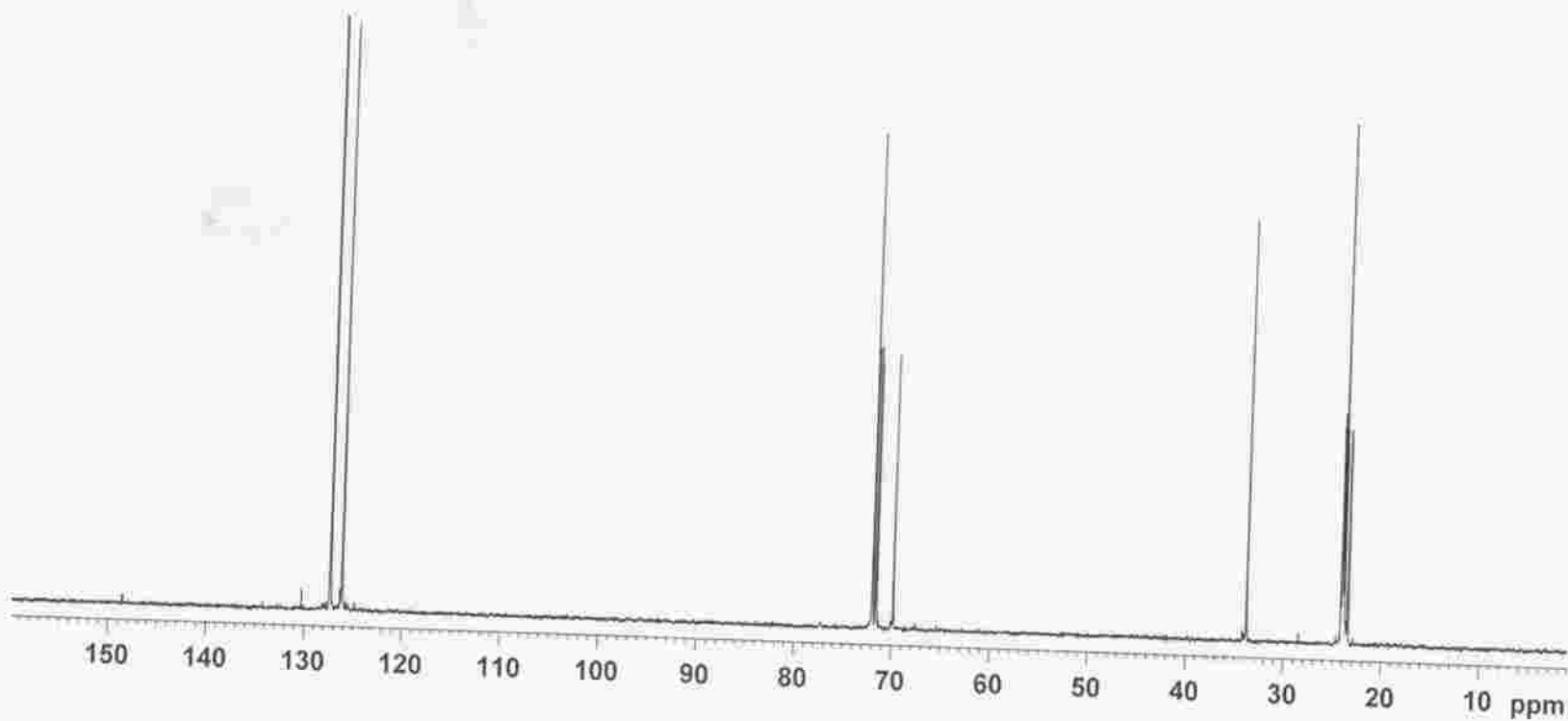


127.350
127.270
126.122
126.092

71.982
71.889
71.639
71.539
69.839

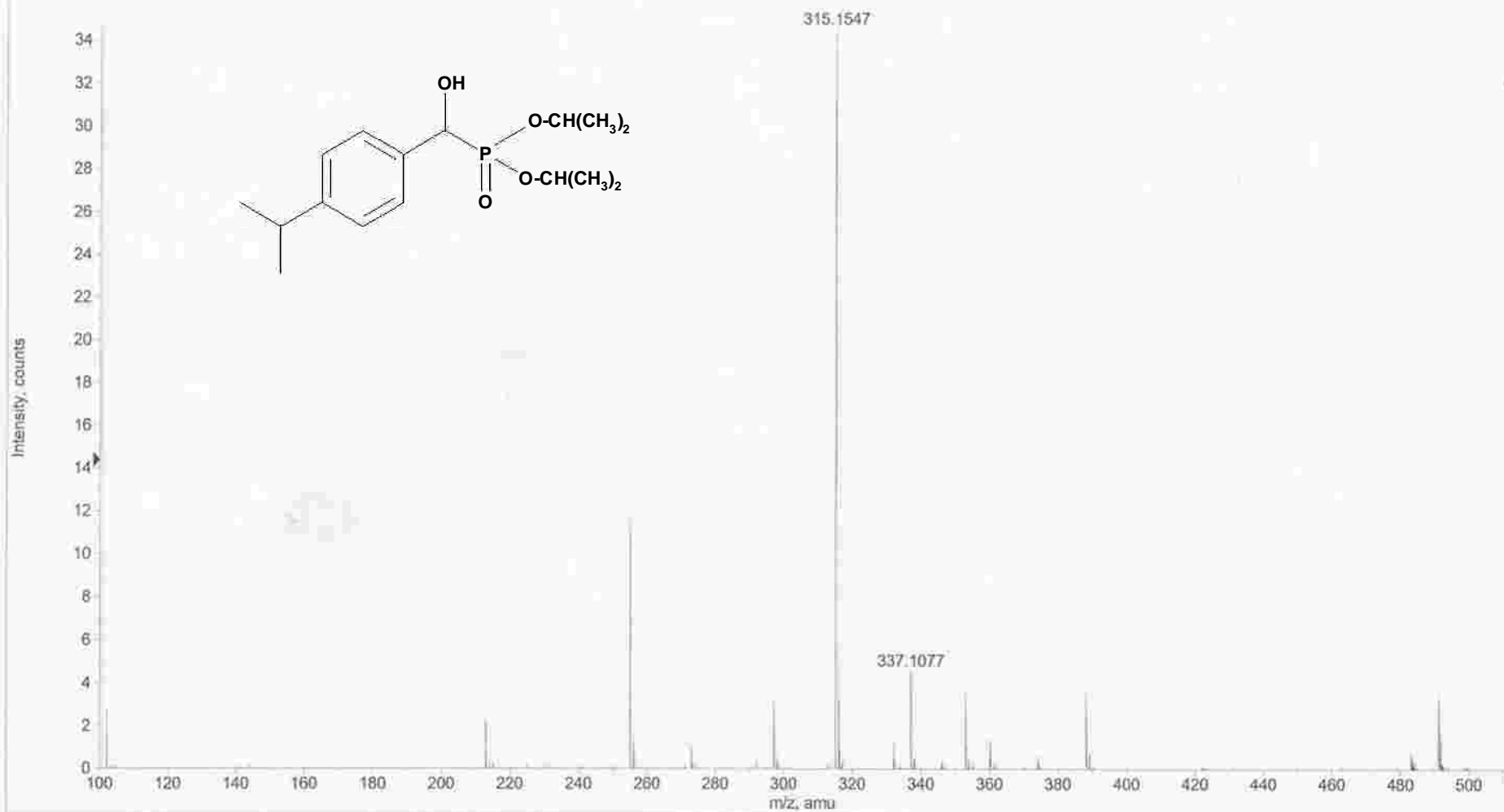
33.812
24.185
24.146
24.056
24.007
23.961
23.850
23.782
23.700
23.601
23.480
23.407

4-Isopropyl_ipr

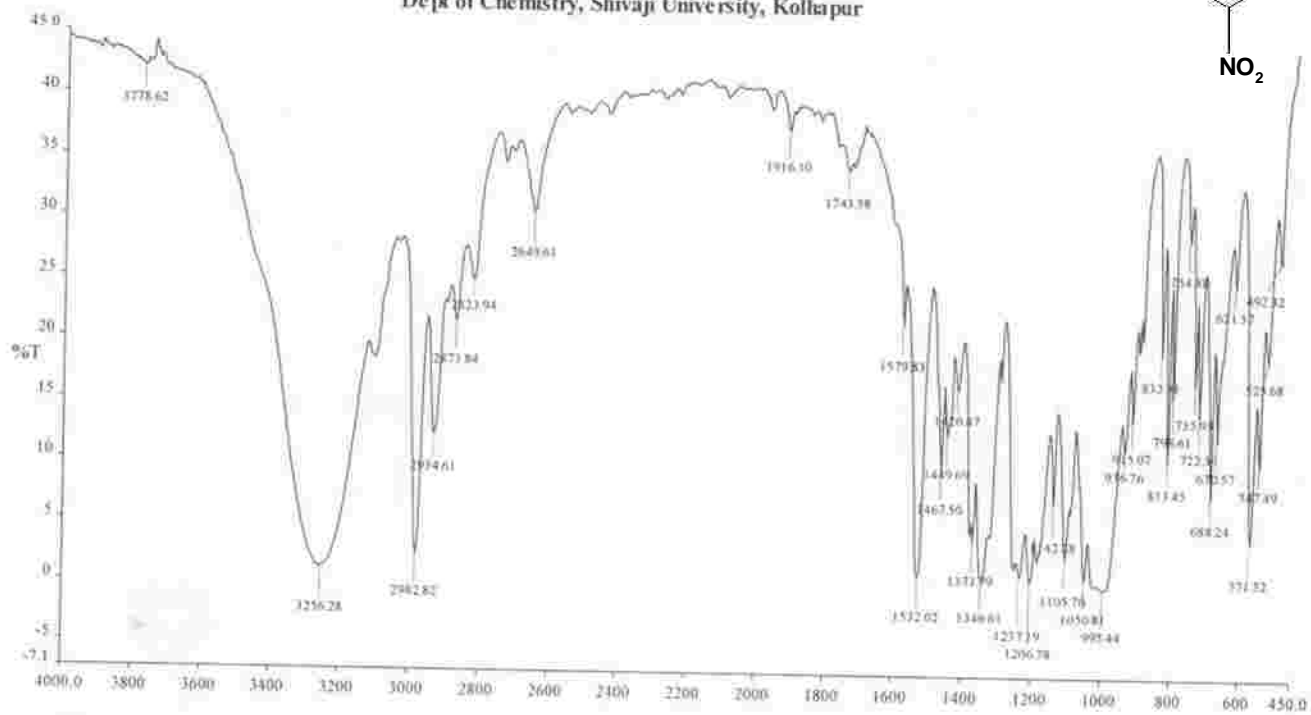
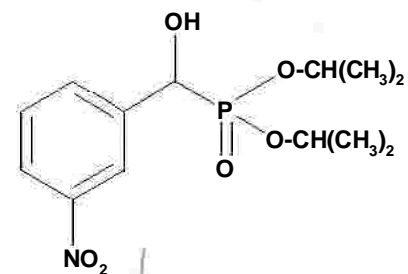


+TOF MS: 0.017 to 0.350 min from ISOPROP_DIPR.wiff
a=3.37719425928799980e-004, t0=-3.54887063182468410e+001

Max. 143.8 counts



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INSTRUMENT MODEL: PERKIN ELMER SPECTRUM 100.

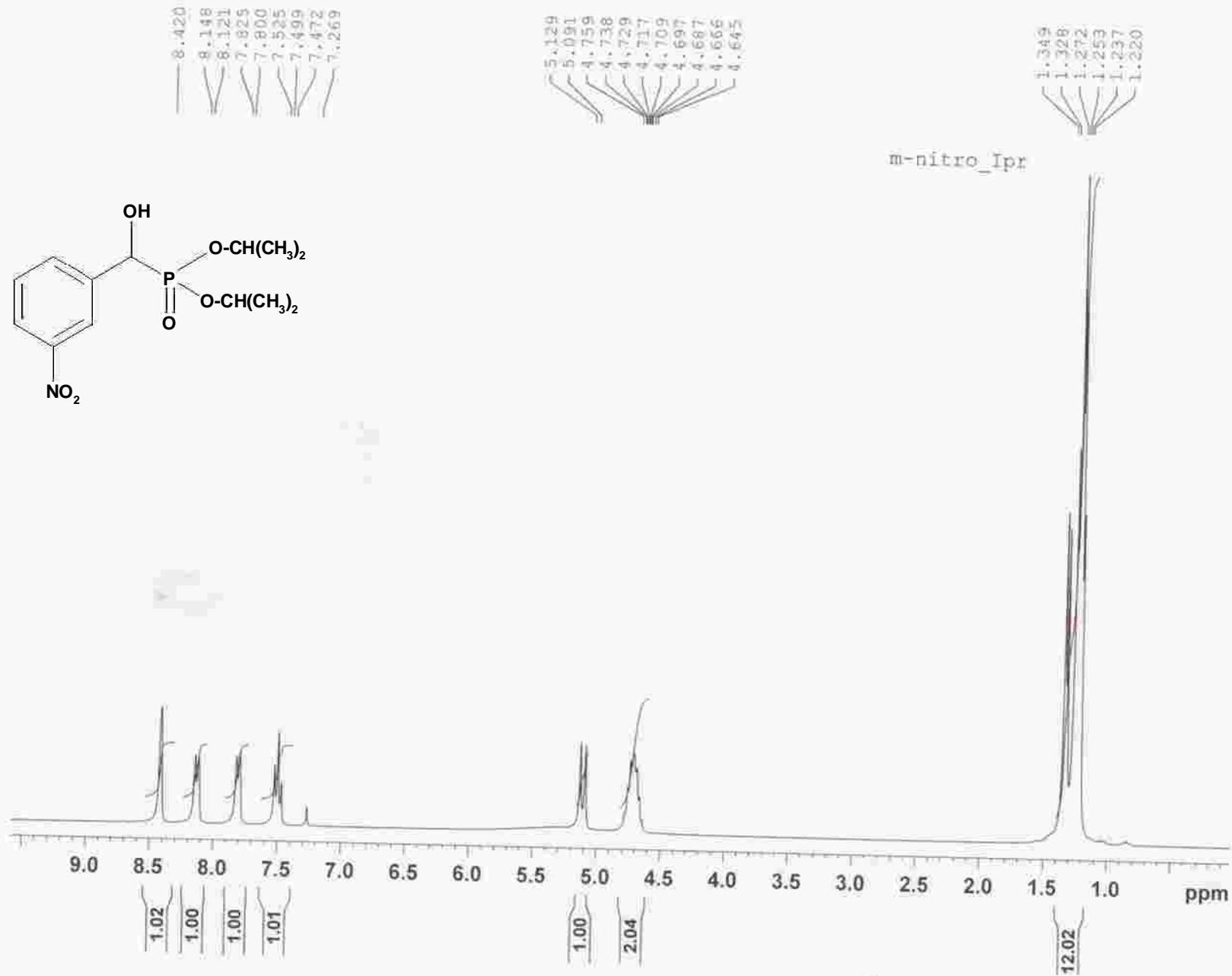
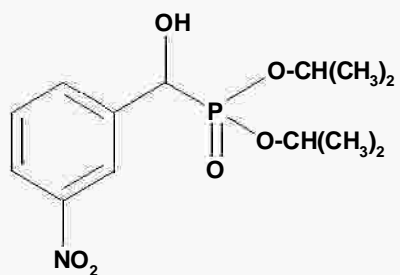
Instrument Serial Number: 79720

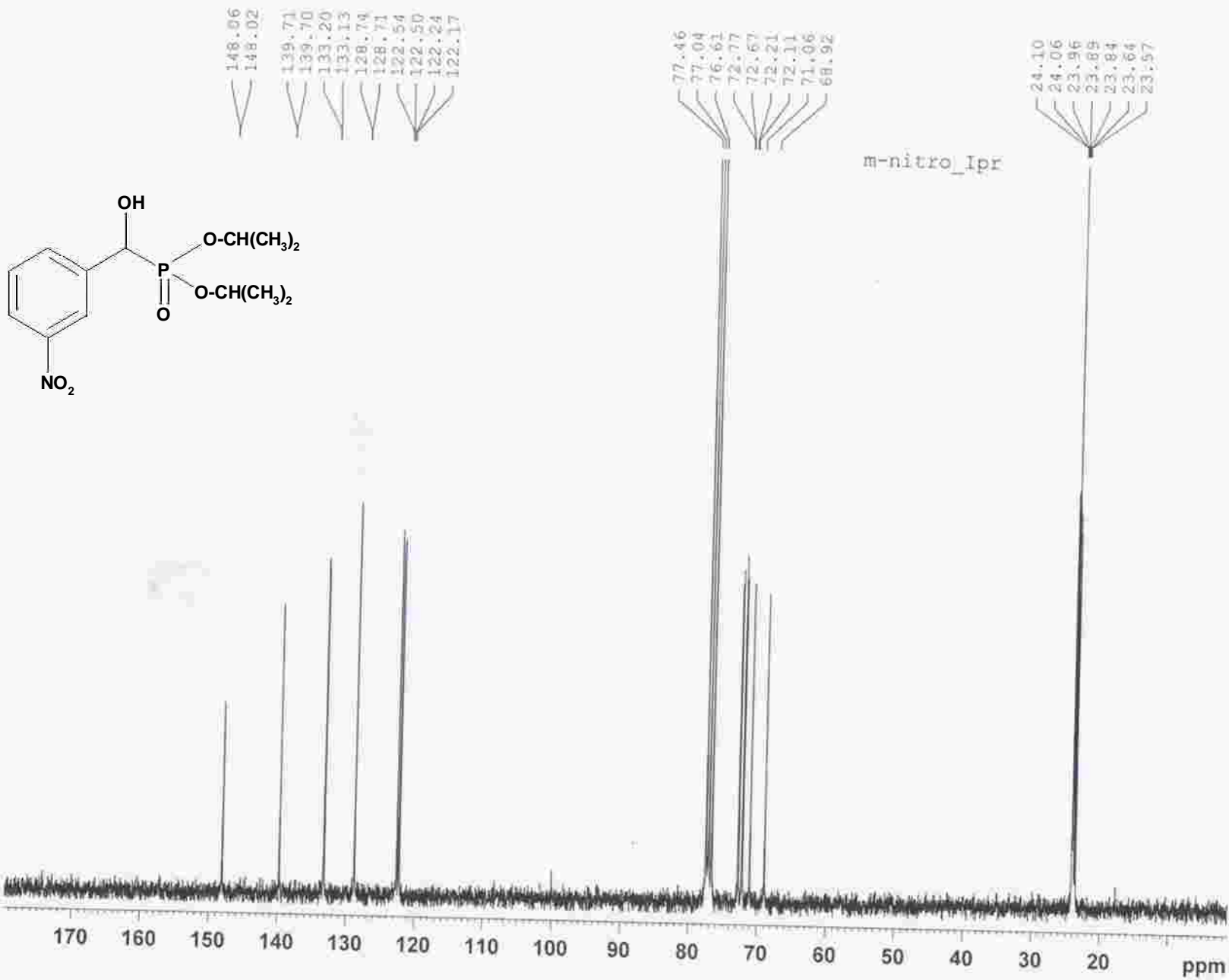
— Ipr-4.002 - 23-09-10

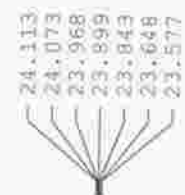
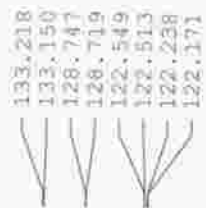
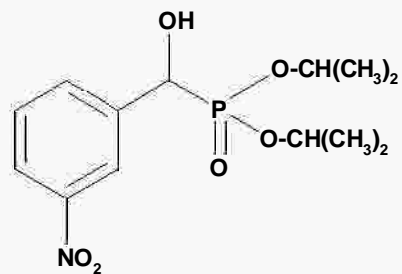
Date Created: 23 September, 2010 5:24 PM India Standard Time

ANALYST:

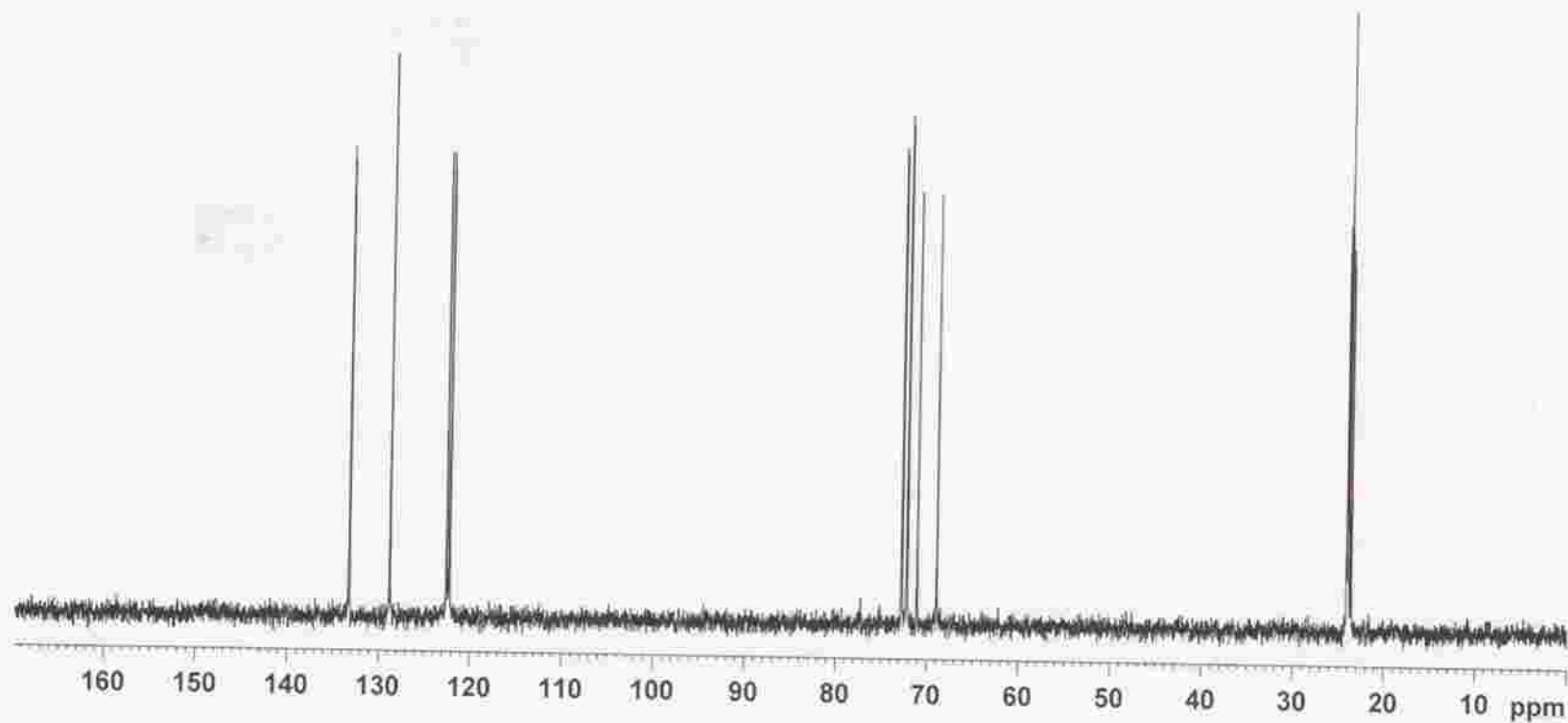
cm-1







m-nitro_ipr

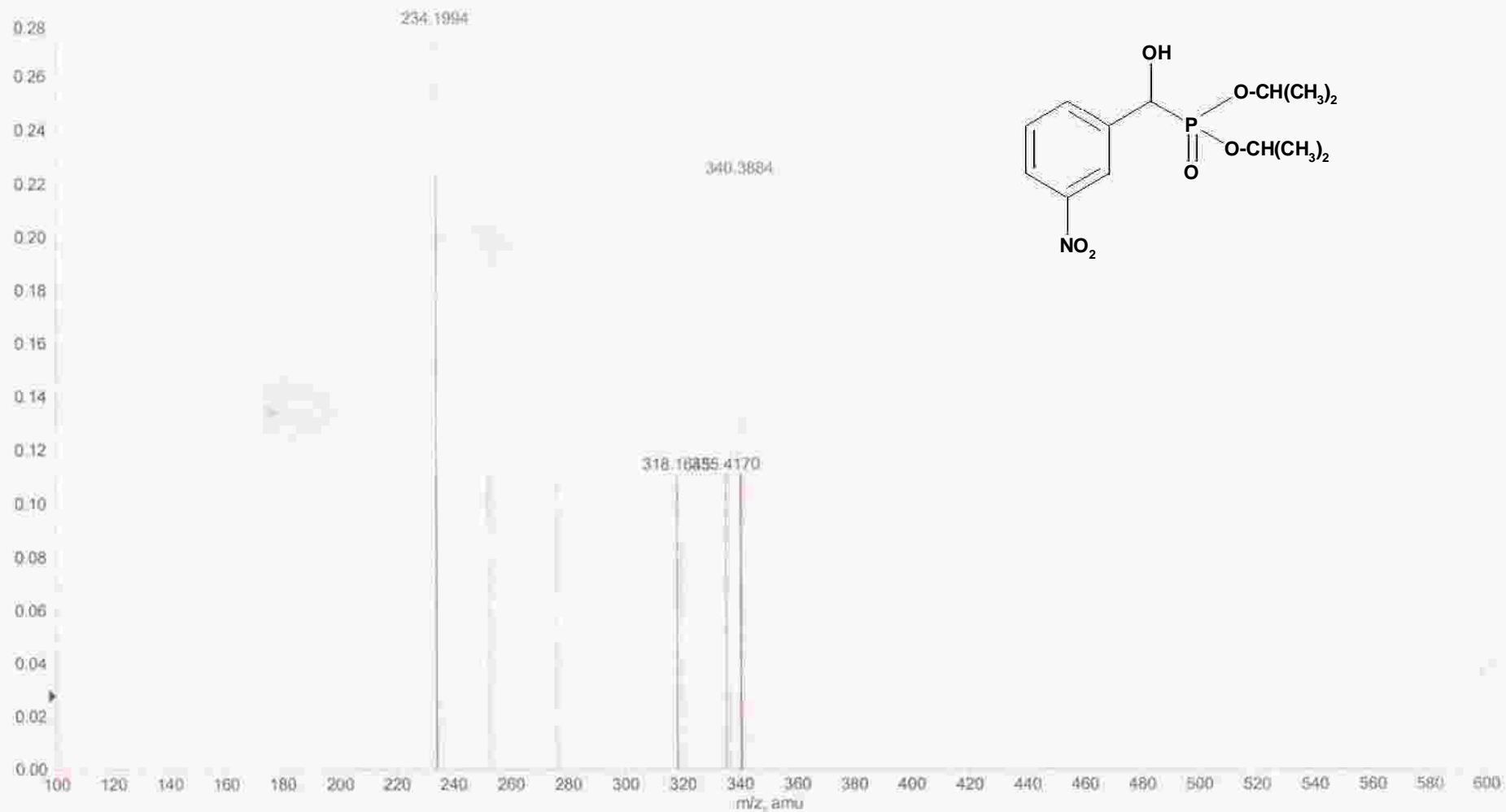


0.000000 0.000000

i-P₂ = 4

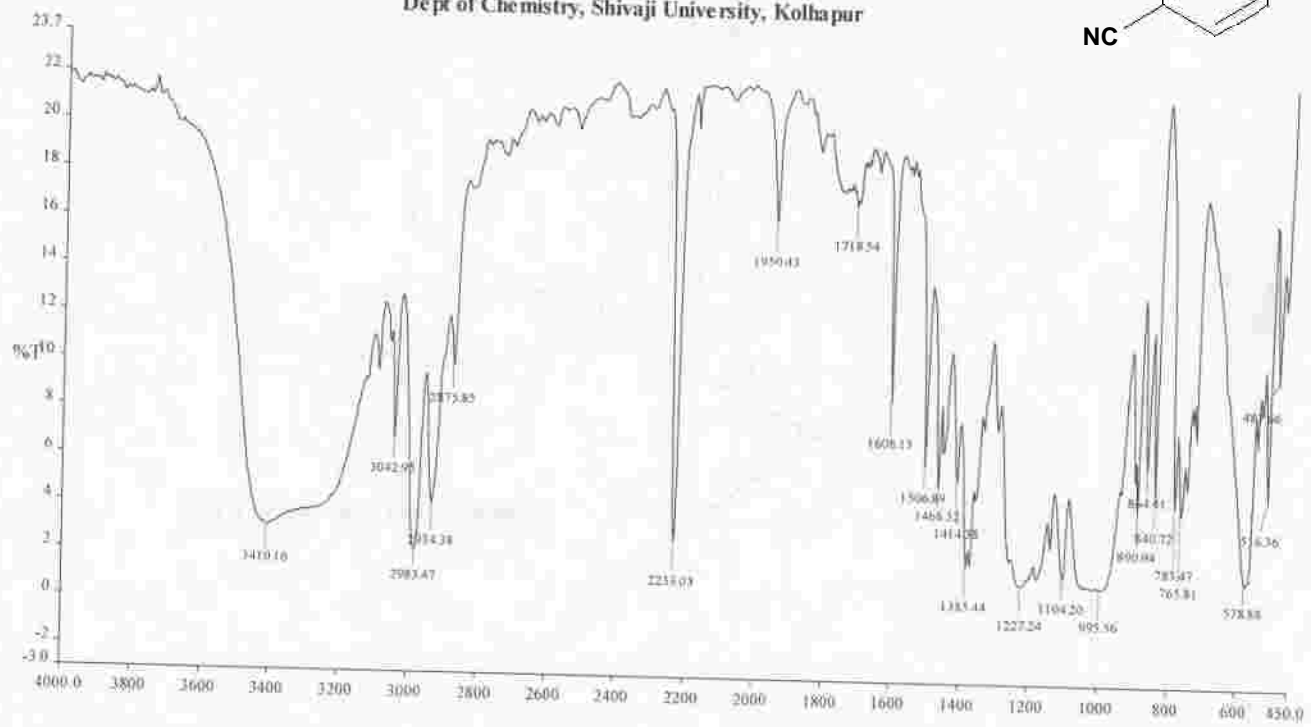
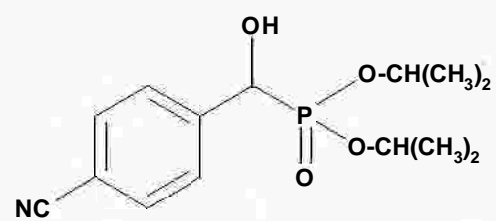
*TOF MS: 0.050 to 0.333 min from IPR-4.wif
a=3.31839173977184490e-004, t0=3.49418683411422530e+001

Max: 0.3 counts



GMI-1

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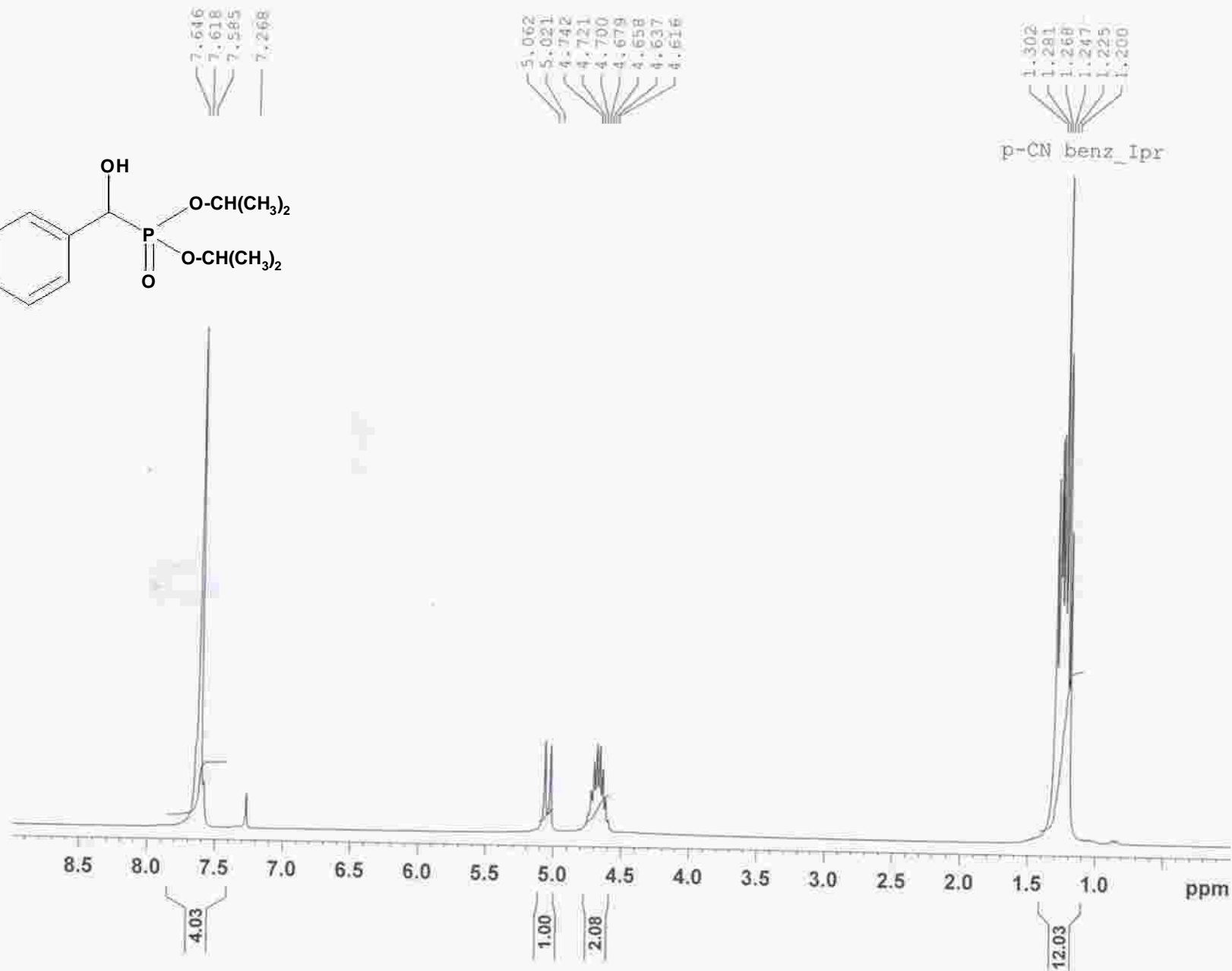
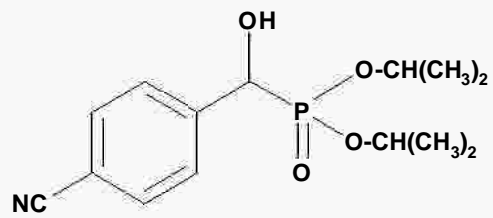


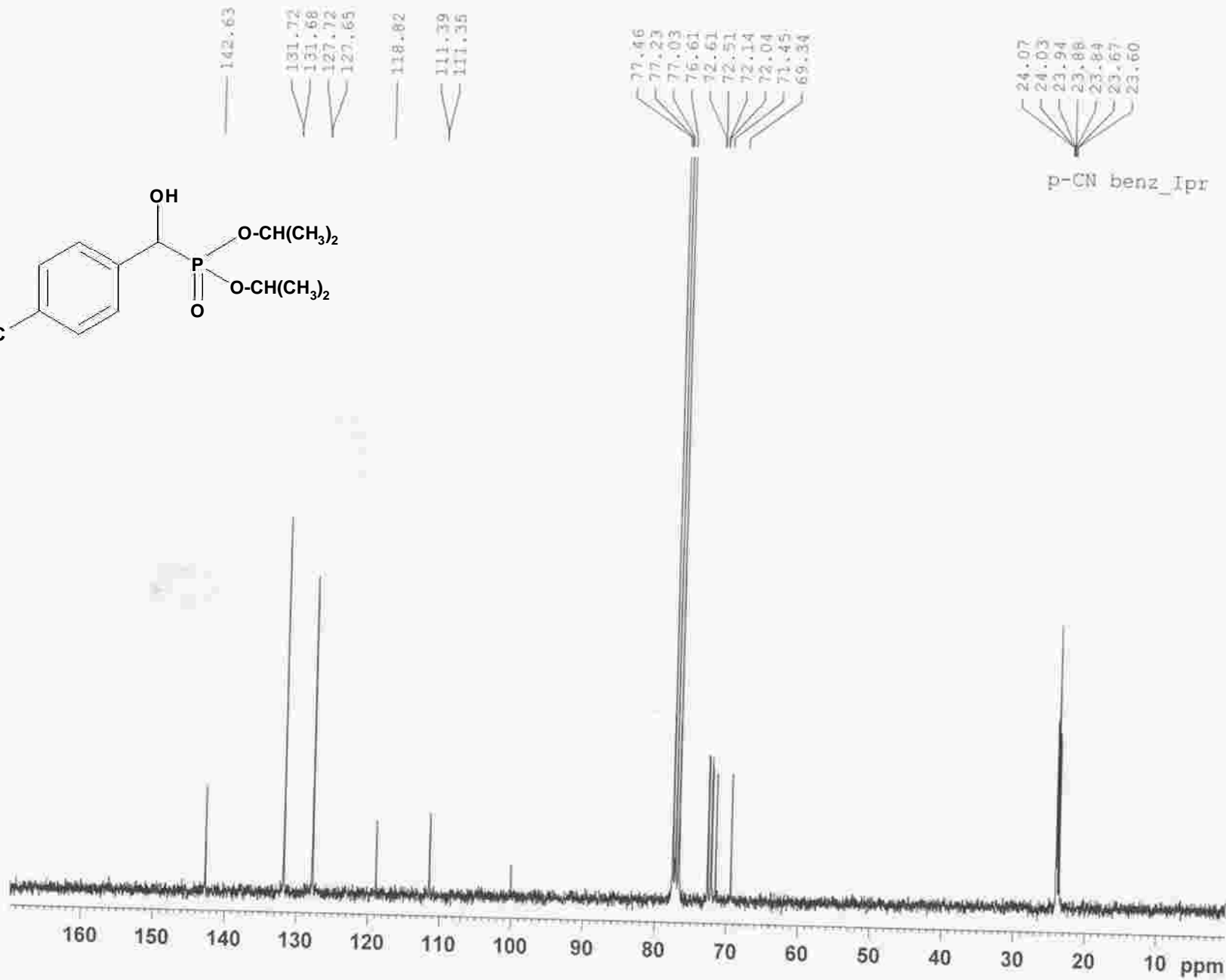
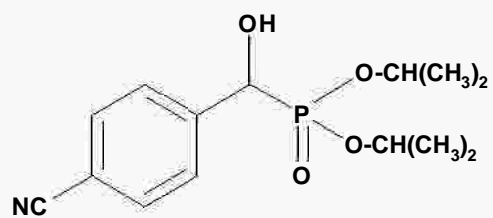
INSTRUMENT MODEL: PERKIN ELMER SPECTRUM 100.
Instrument Serial Number: 79720
Ipr-3.002 - 23-09-10

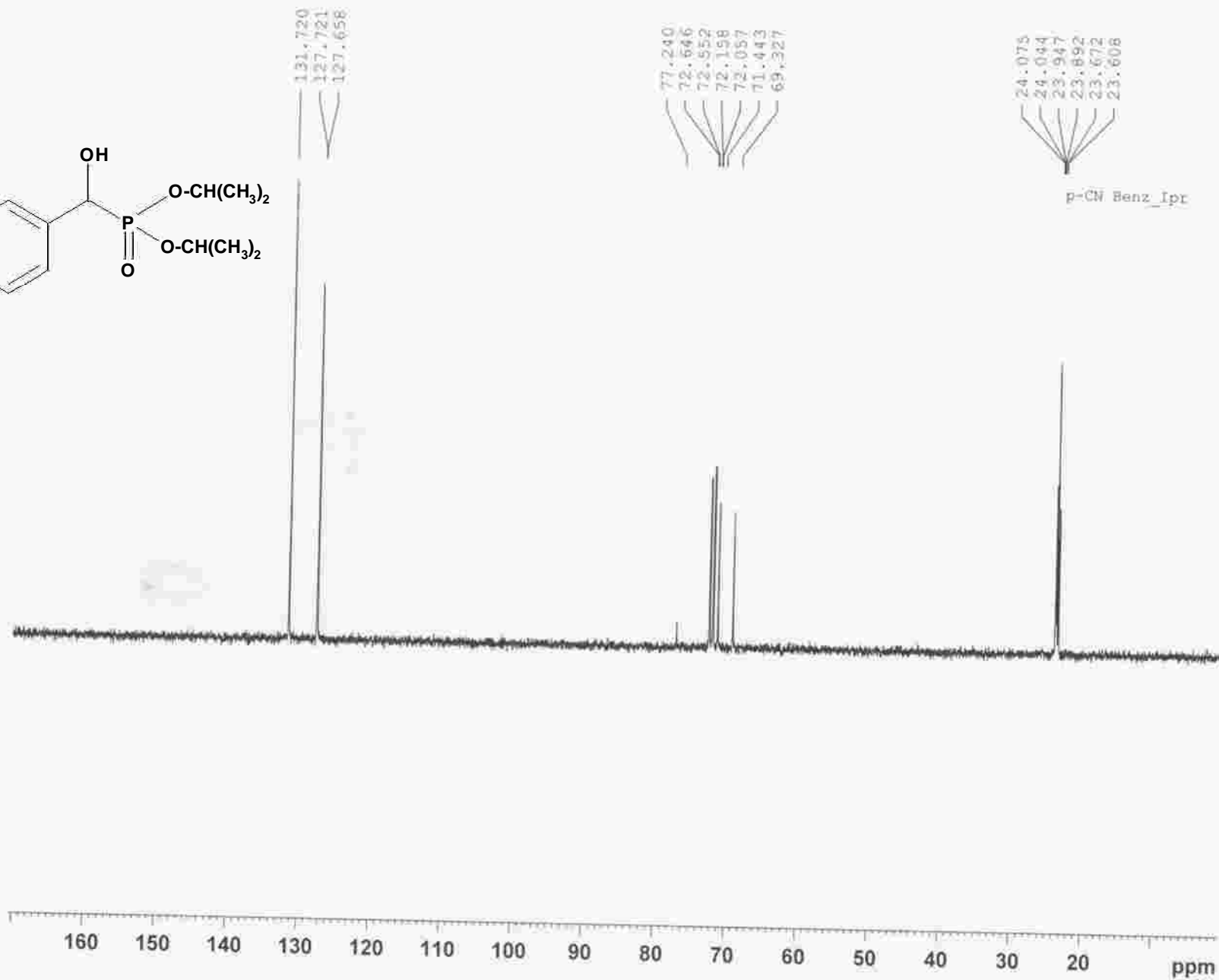
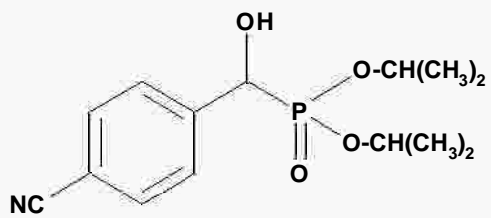
Date Created: 23 September, 2010 4:28 PM India Standard Time

ANALYSIS:

cm-1



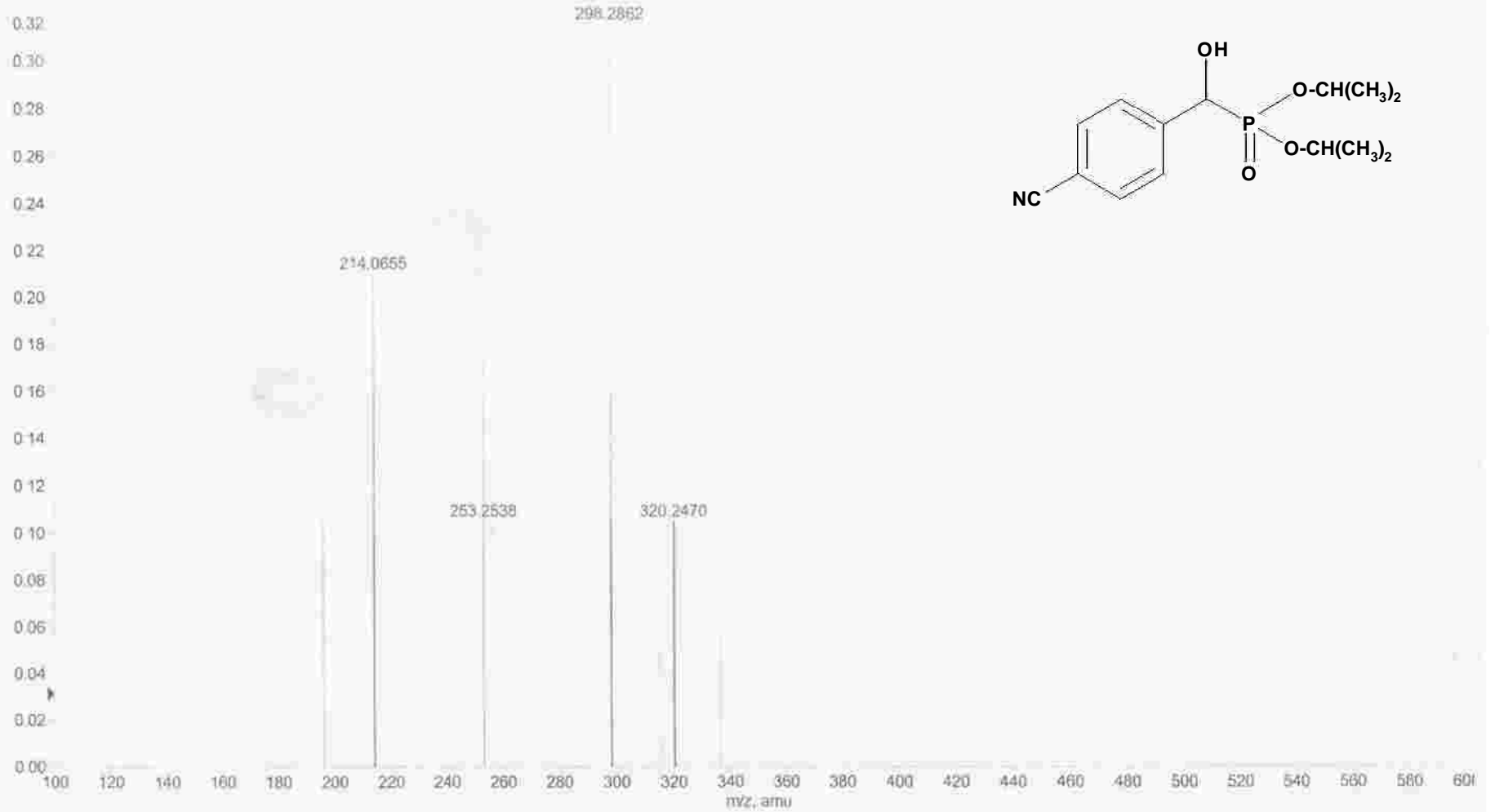




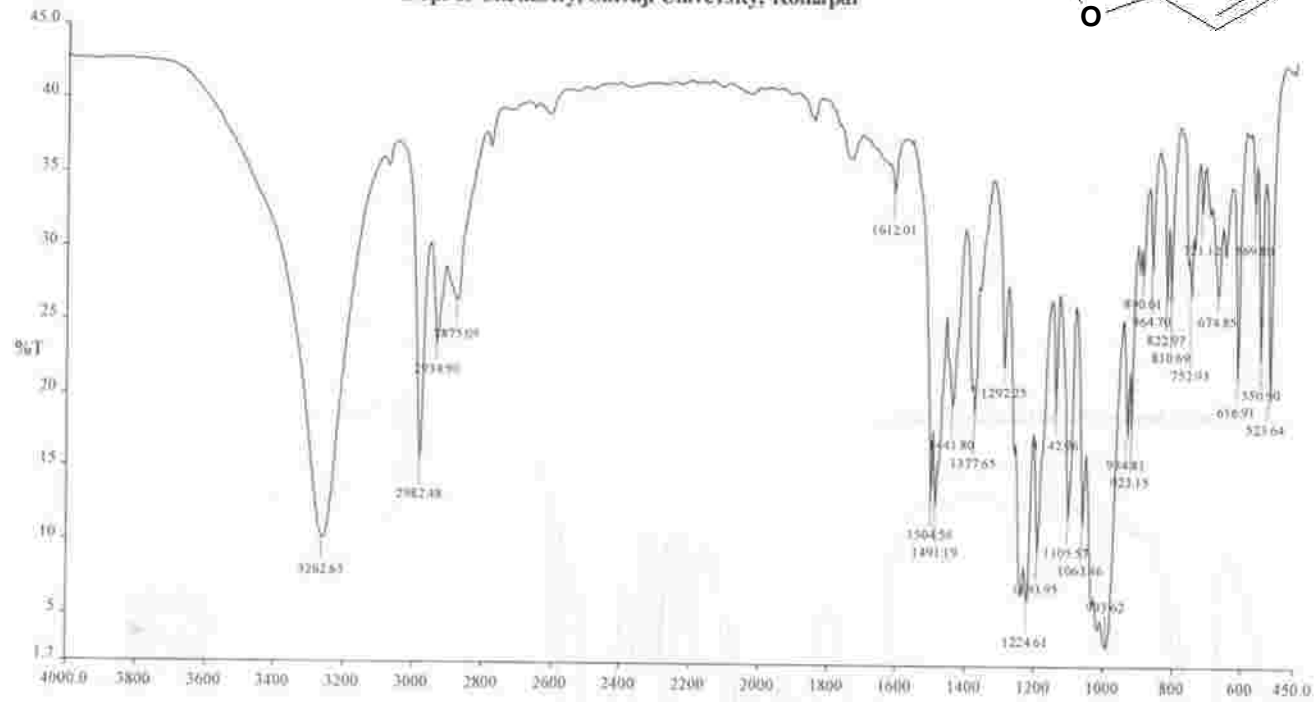
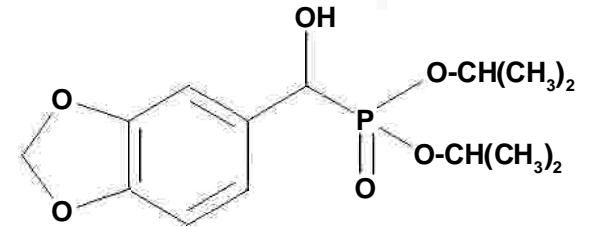
2-Pr-3

Max: 0.3 counts

+TOF MS: 0.050 to 0.350 min from IPR-3.wiff
a=3.31839173977164490e-004, 10=-3.49410683411422630e+001



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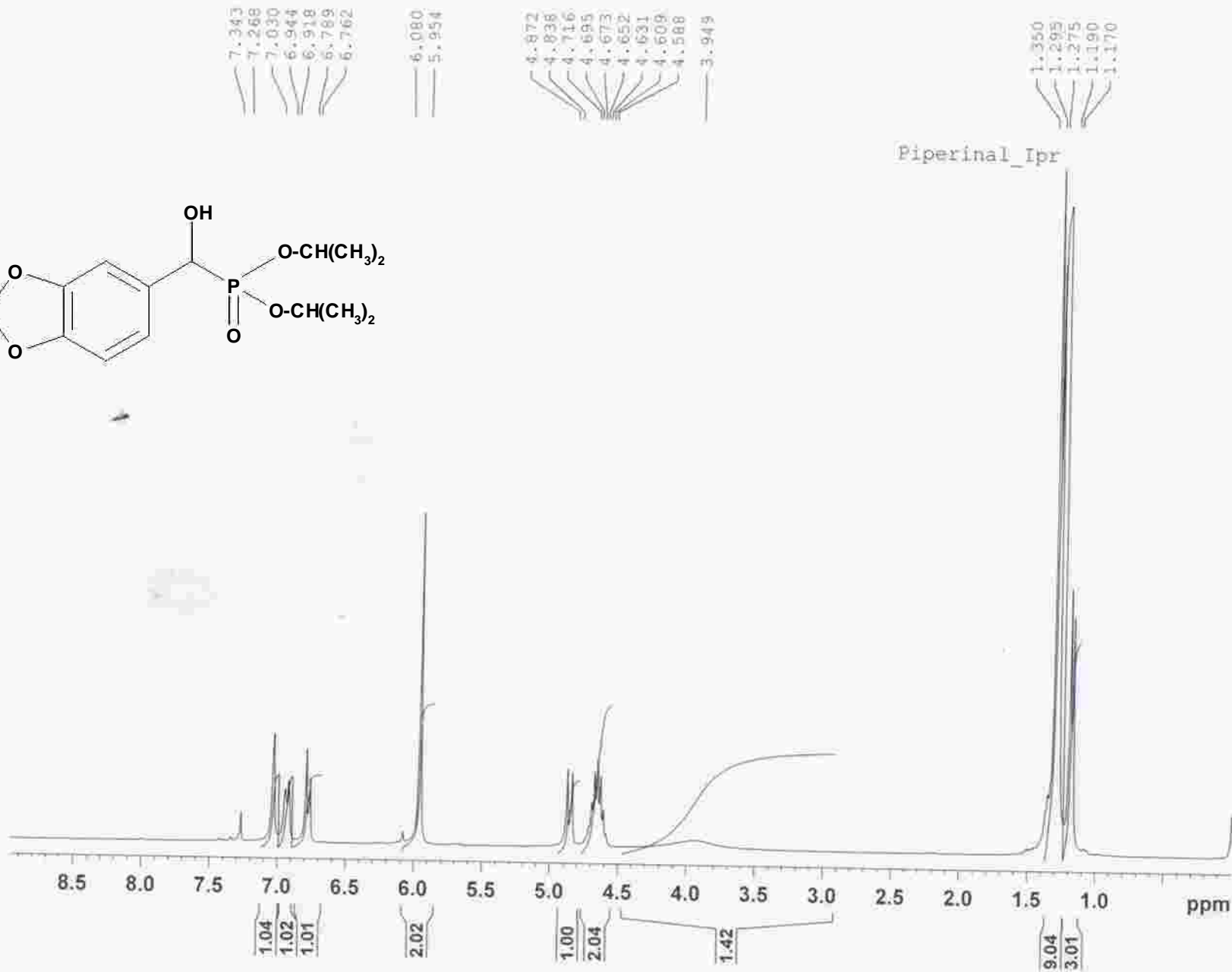
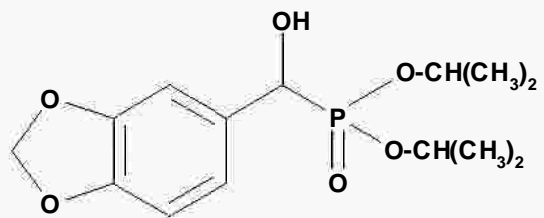


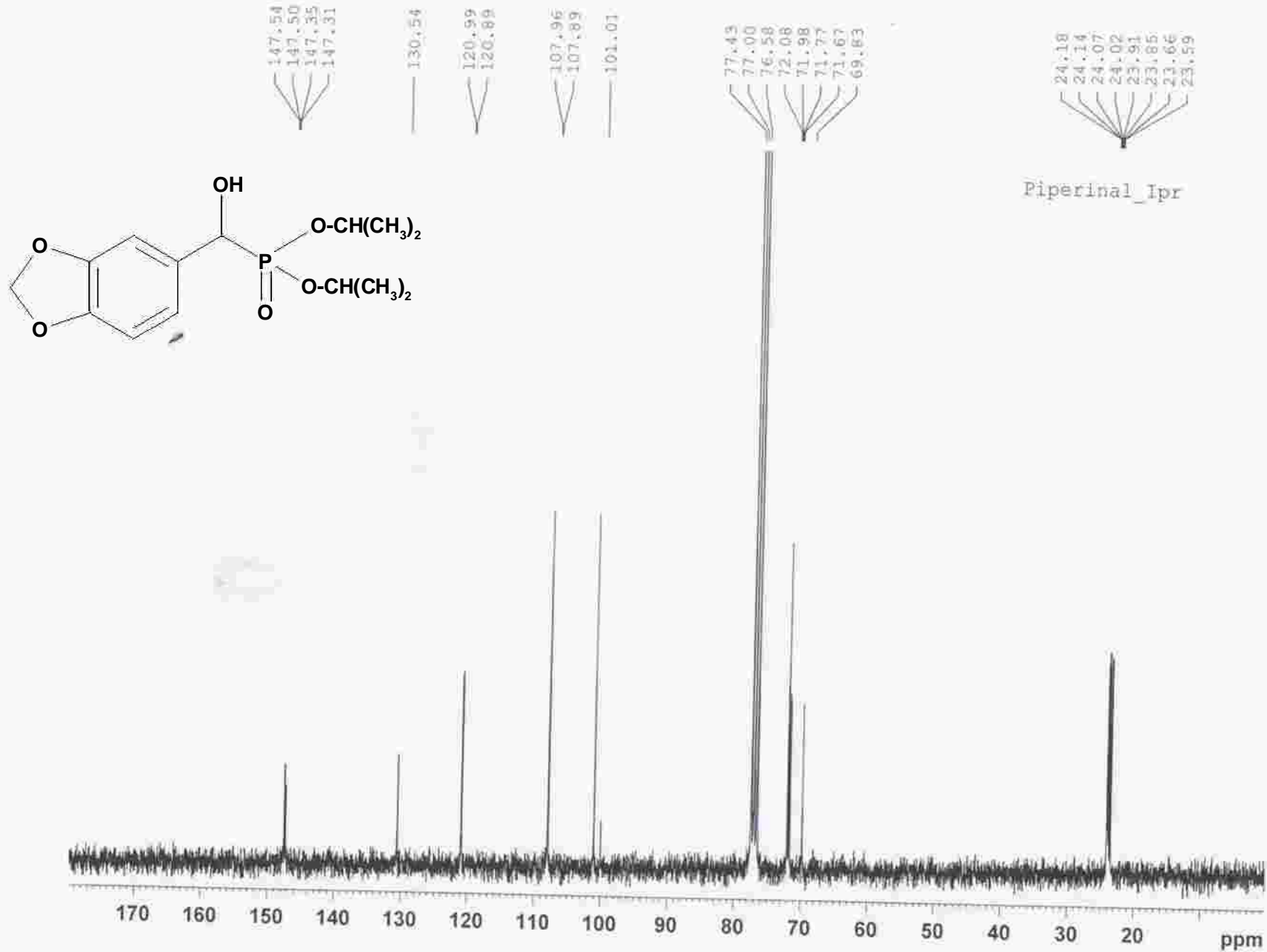
Date Created: 23 September, 2010 9:47 PM India Standard Time

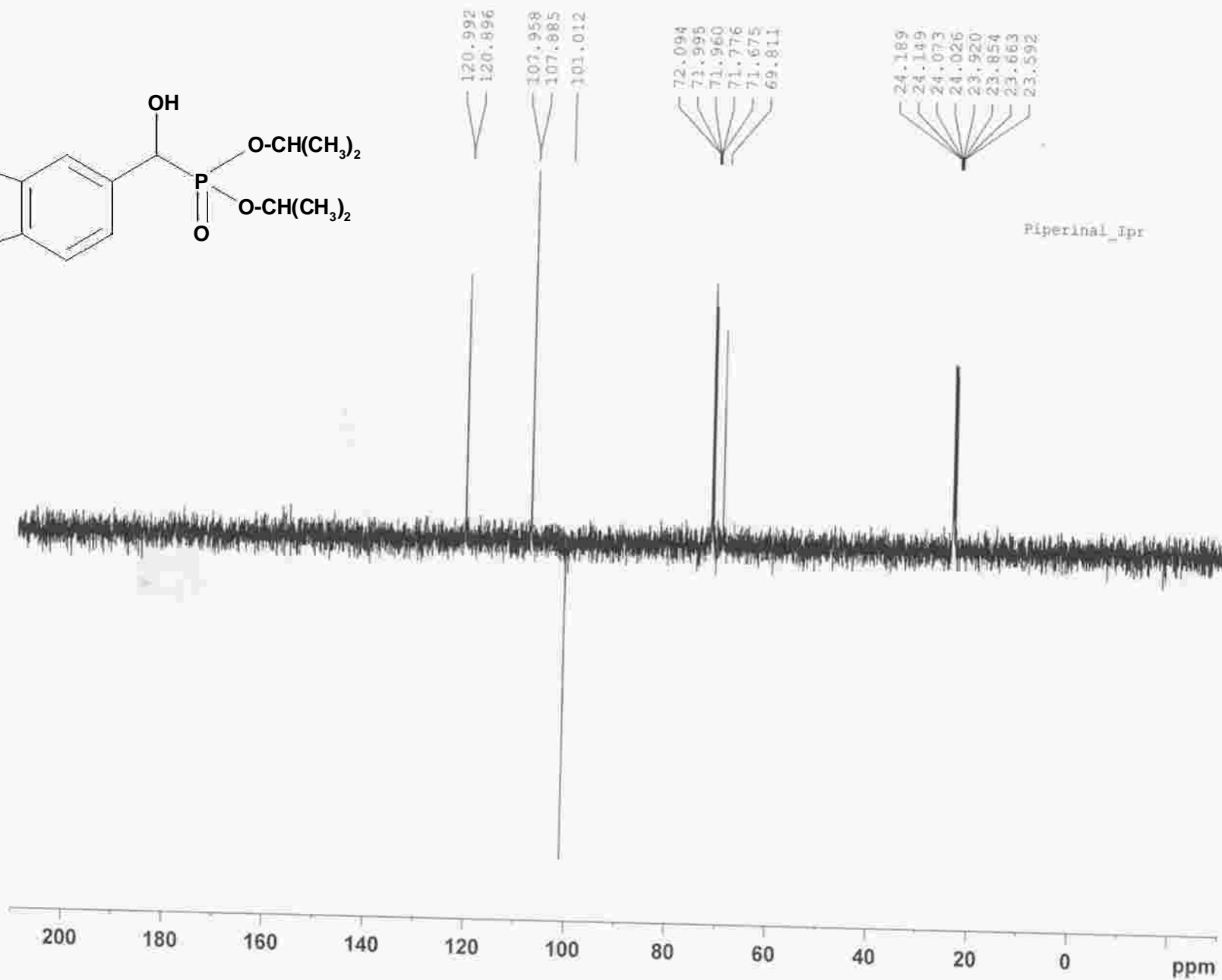
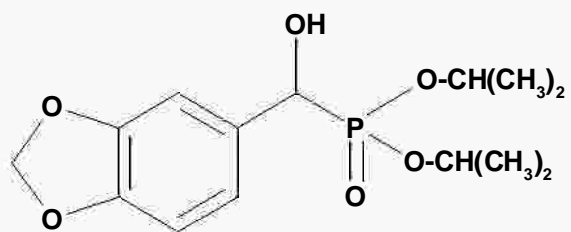
INSTRUMENT MODEL: PERKIN ELMER SPECTRUM 100.
Instrument Serial Number: 79720

— Piperial-DIP.002 - 23-09-10

ANALYSIS
cm-1

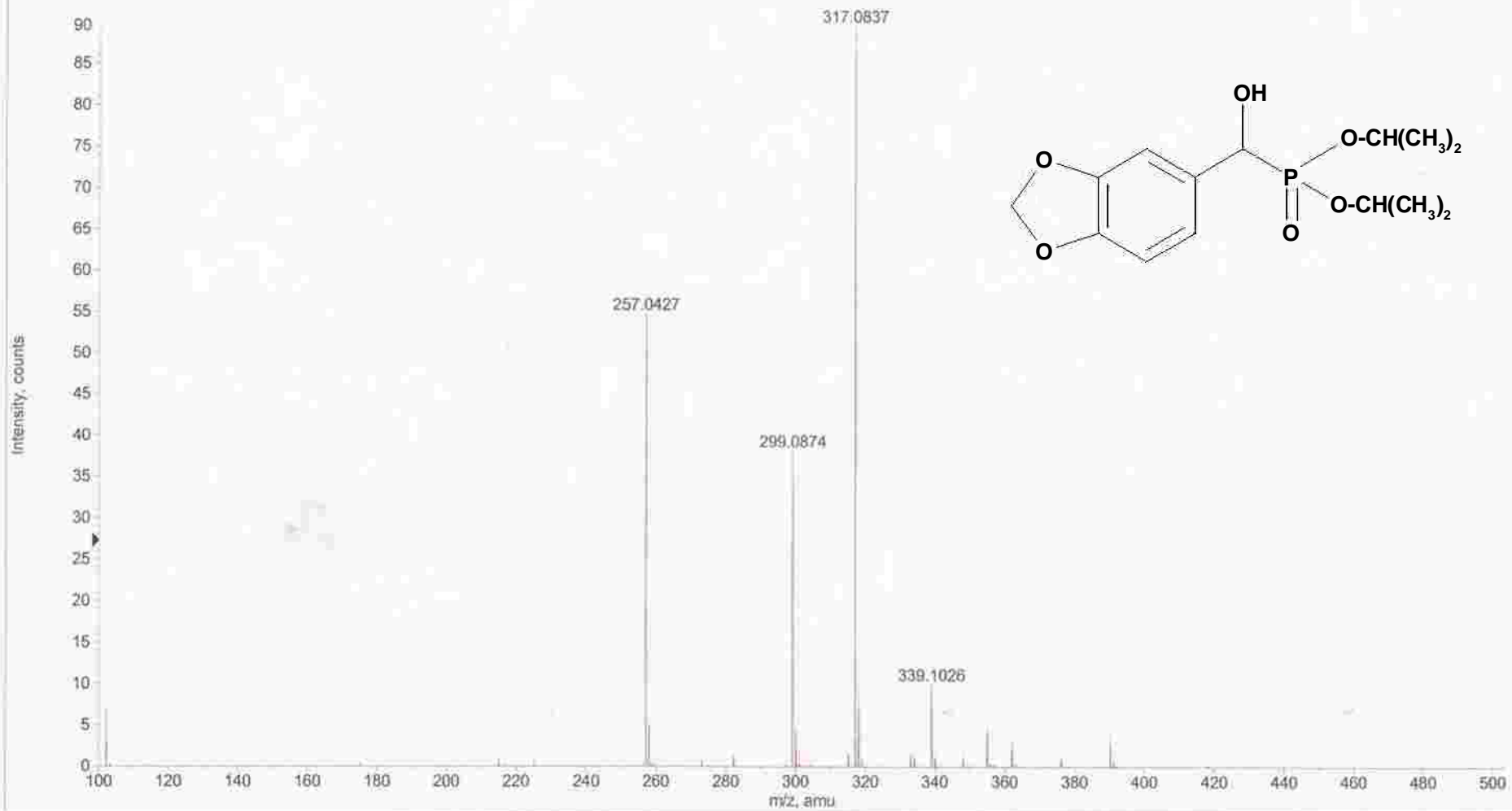


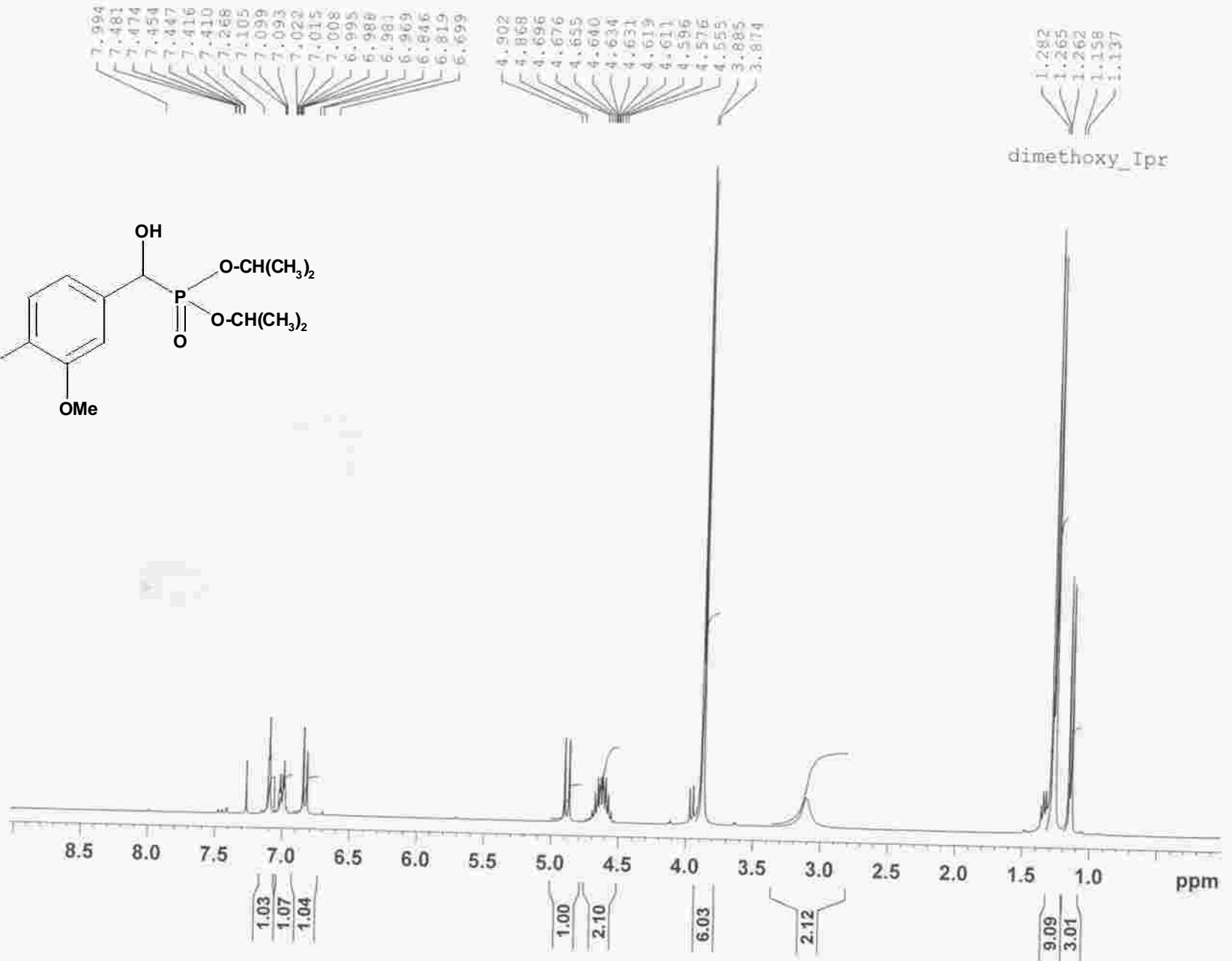
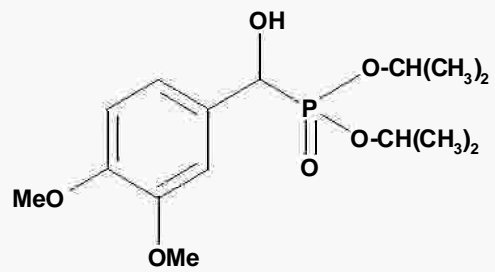


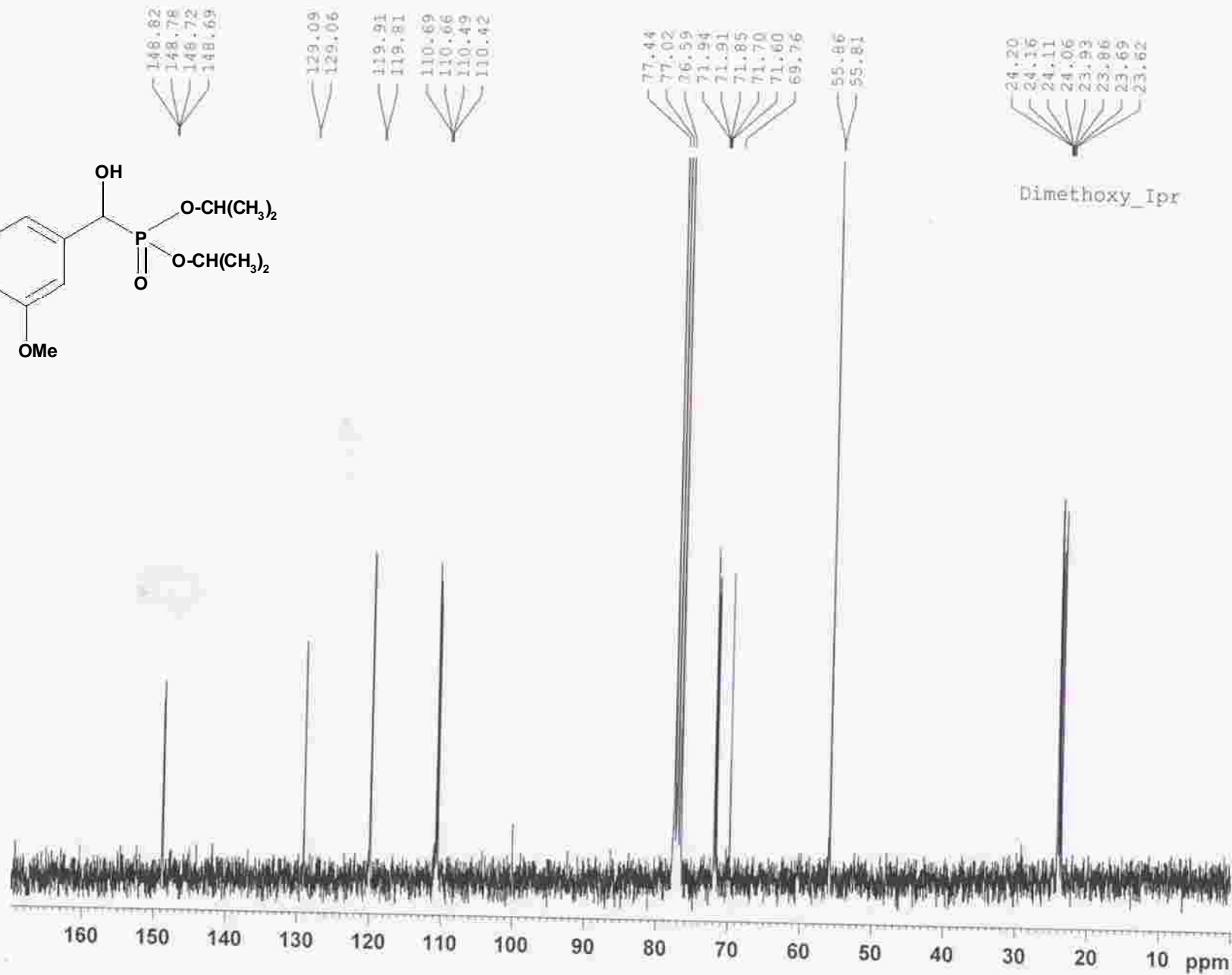
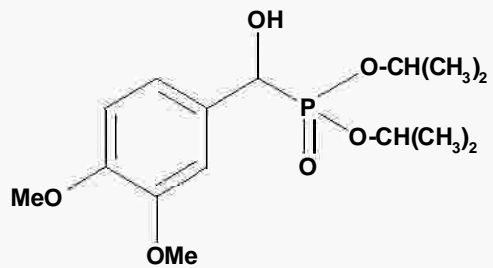


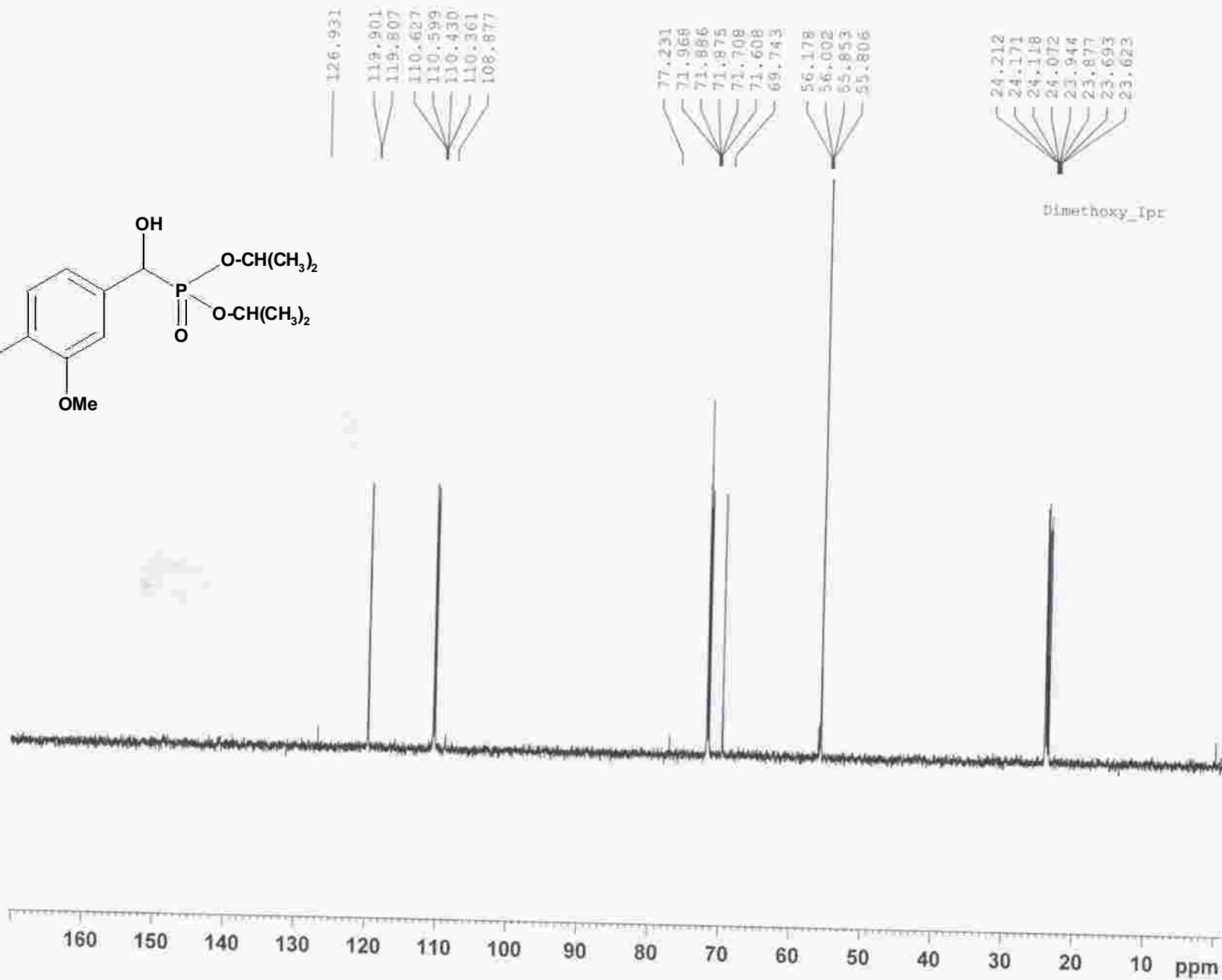
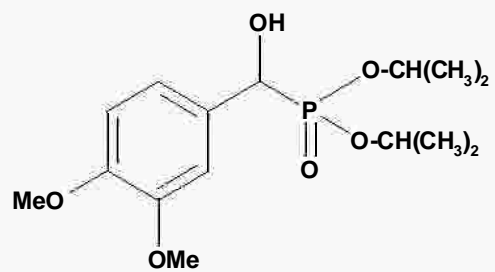
+TOF MS: 0.017 to 0.417 min from PIPERNAL_DIPR.wiff
 a=3.37719425928799980e-004, l0=-3.54887063182468410e+001

Max. 272.8 counts.



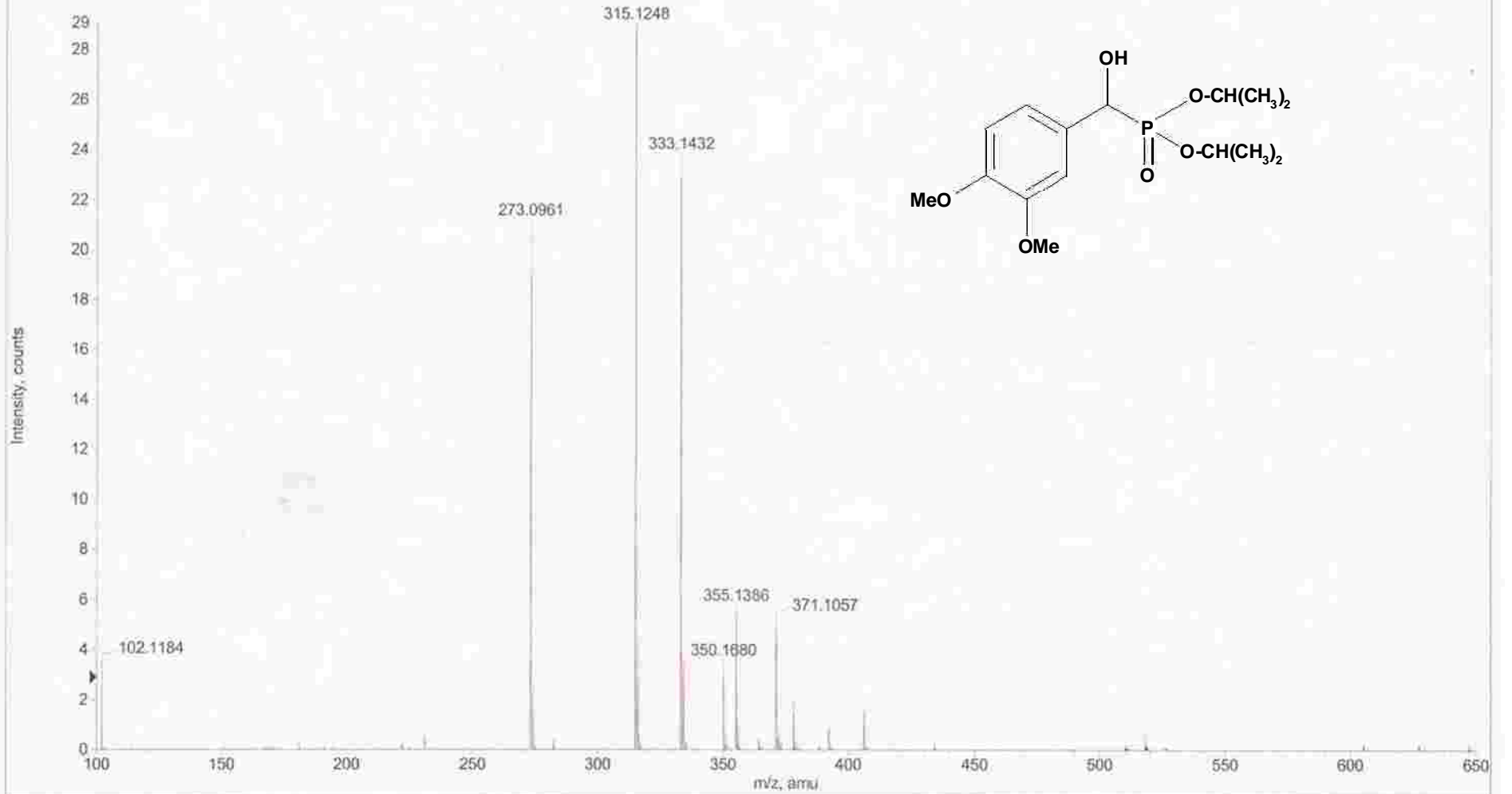




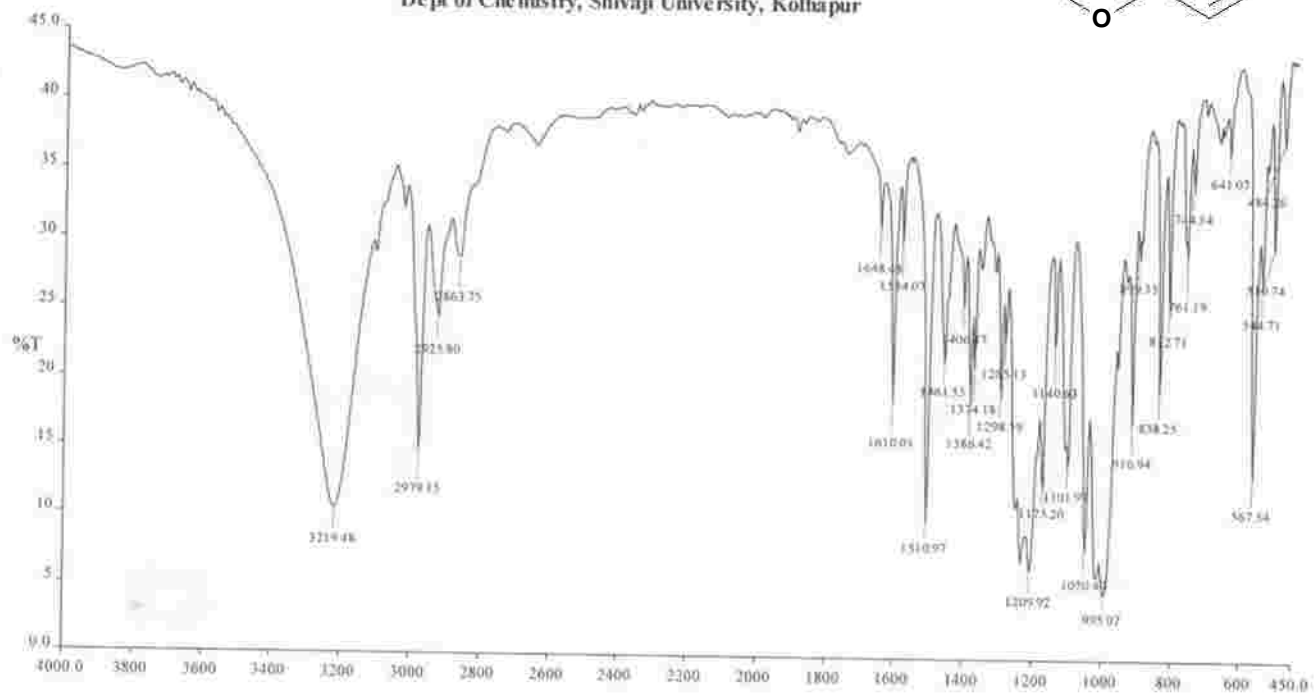
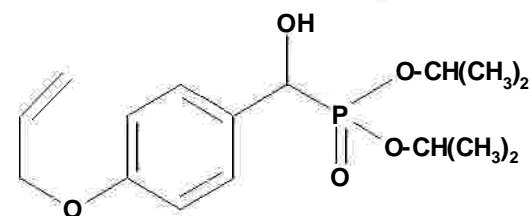


+TOF MS: 0.017 to 0.833 min from 3,4-DI-METOXY_DiPR.wiff
 a=3.37719425928799980e-004, t0=-3.54887063182468410e+001

Max. 29.1 counts



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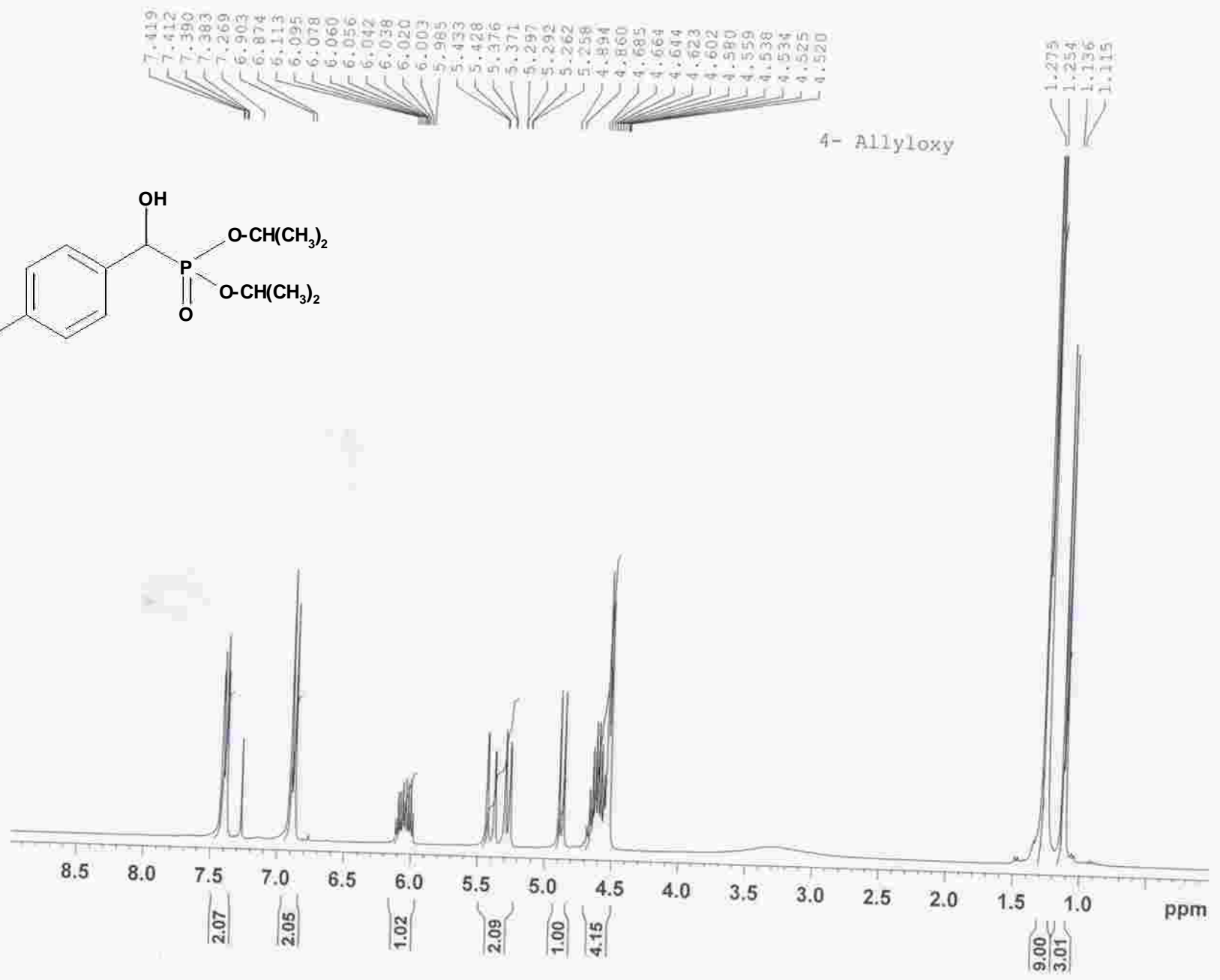
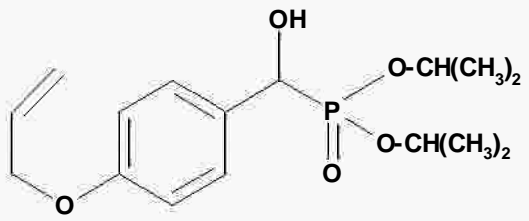
INSTRUMENT MODEL: PERKIN ELMER SPECTRUM 100,
Instrument Serial Number: 79720

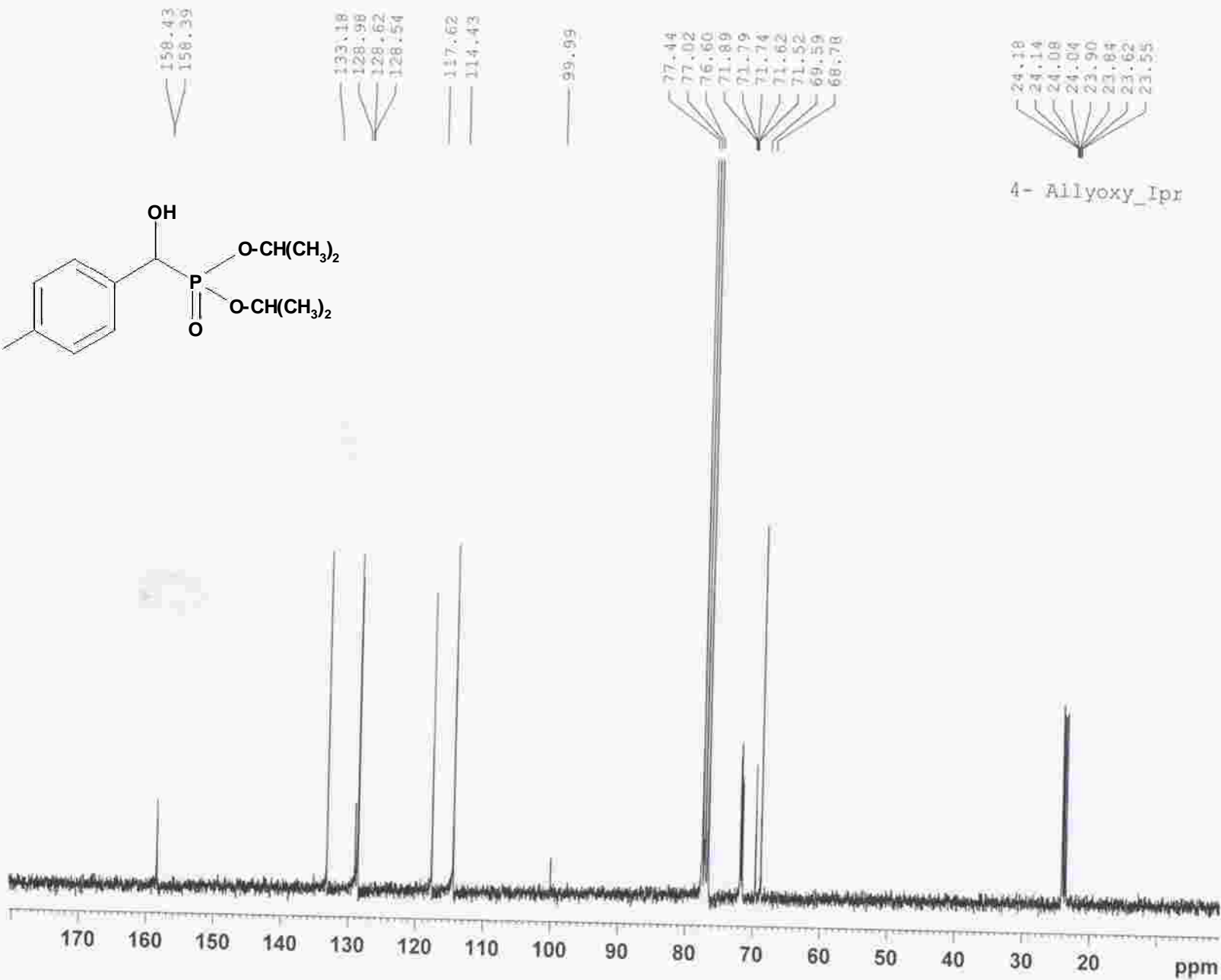
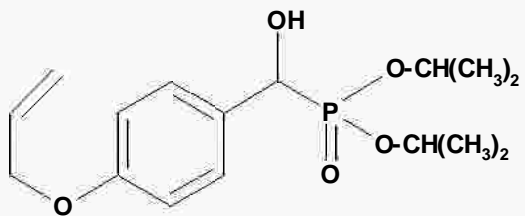
— Ipr-8.002 - 23-09-10

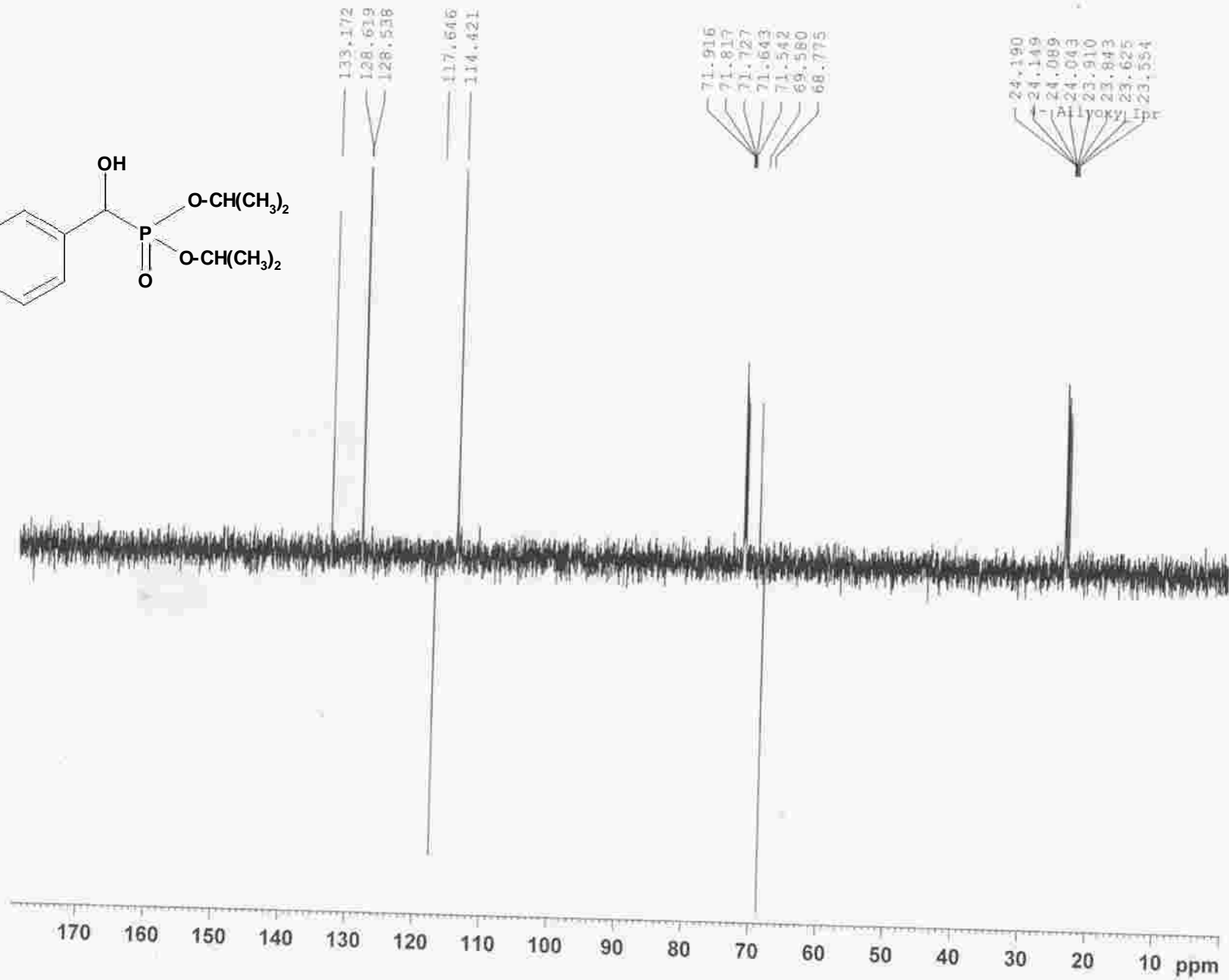
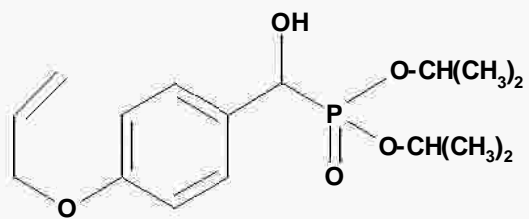
Date Created: 23 September, 2010 8:33 PM India Standard Time

ANALYST:

cm-1

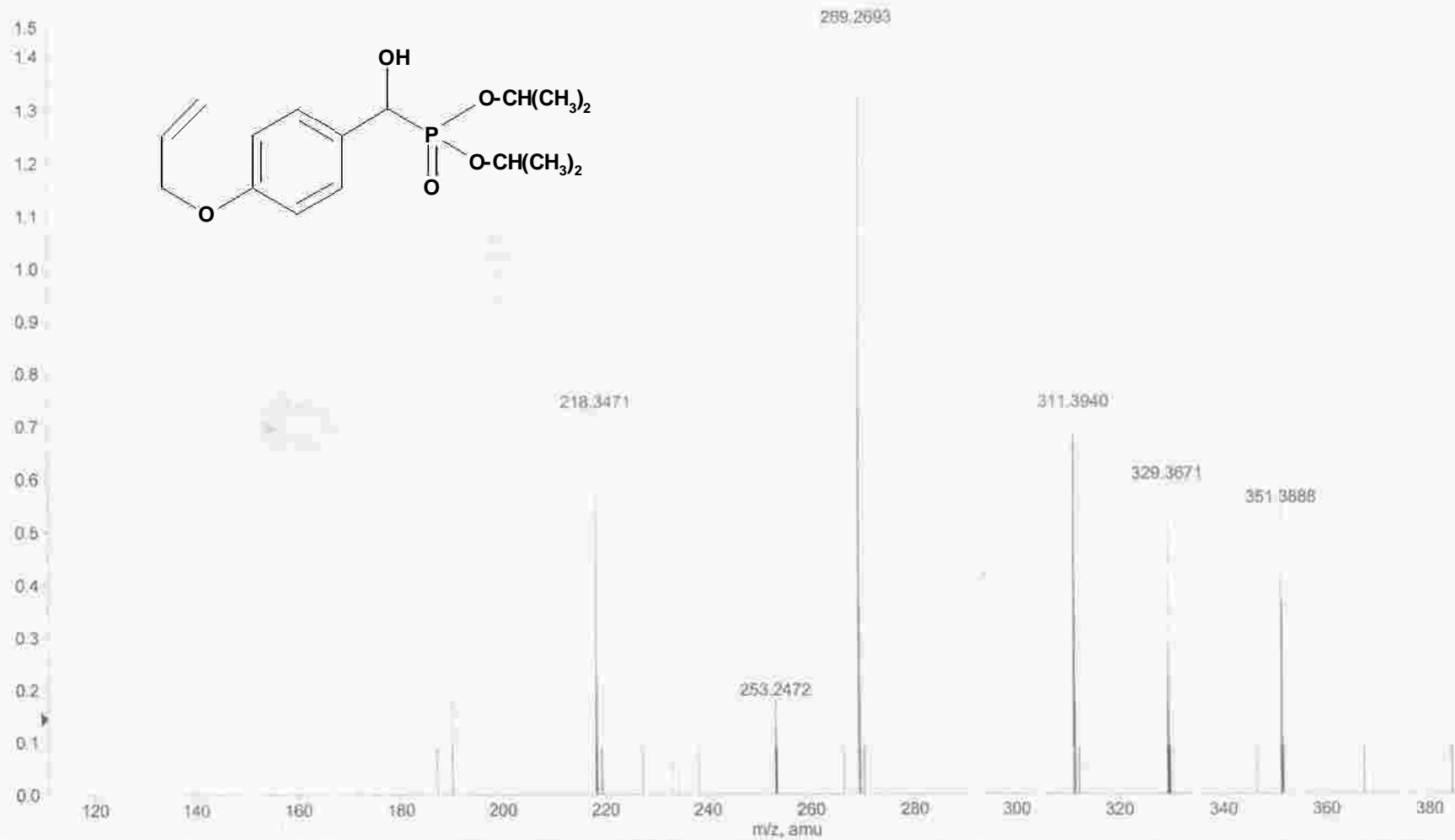




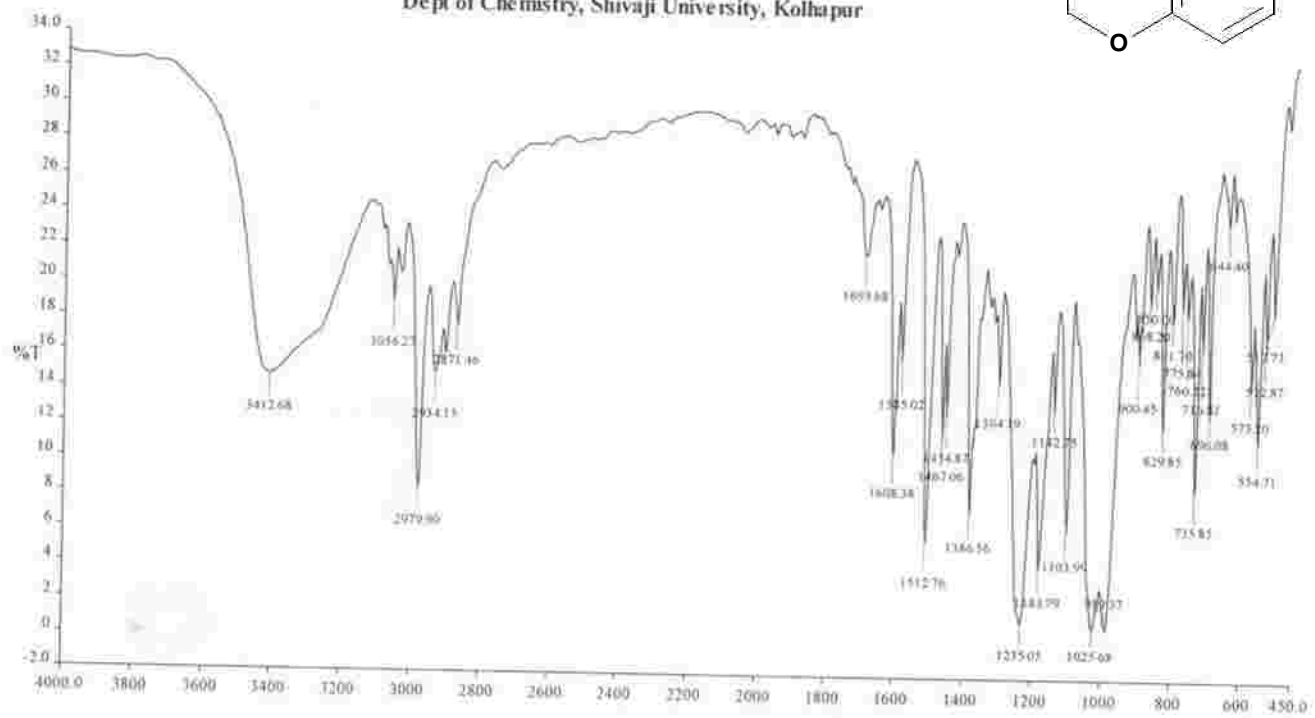
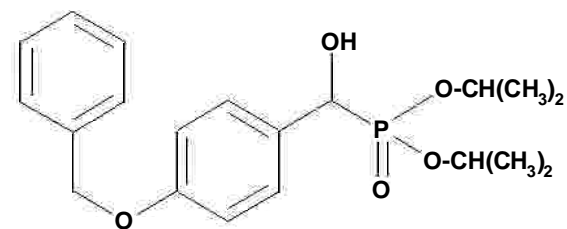


+TOF MS: 0.050 to 0.400 min from IPR-8.wiff
a=3.31839173977164490e-004, ID=-3.40418683411422530e+001

Max 1.5 counts



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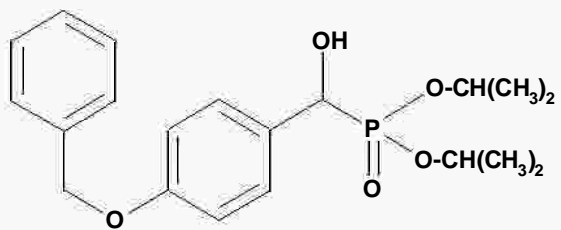
INSTRUMENT MODEL: PERKIN ELMER SPECTRUM 100.
Instrument Serial Number: 79720

— IPR-9.002 - 23-09-10

cm-1

Date Created: 23 September, 2010 9:05 PM India Standard Time

ANALYSIS:



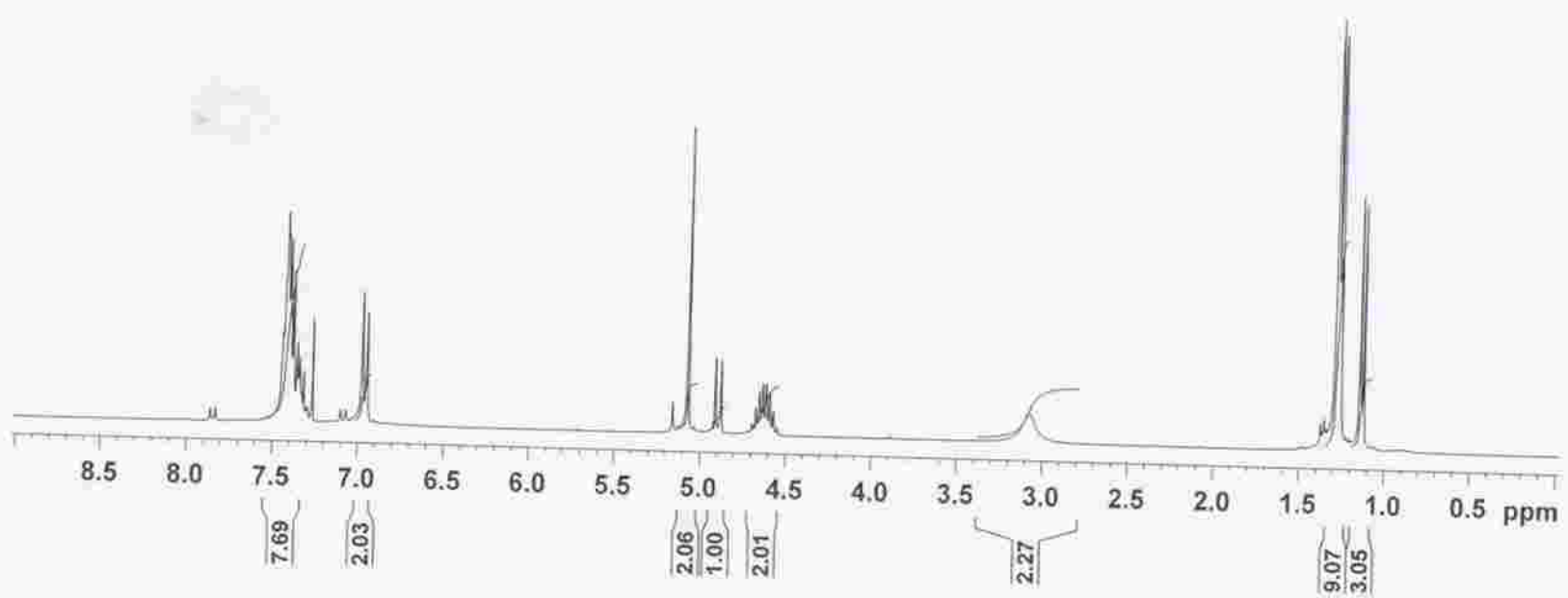
7.862
7.835
7.844
7.833
7.426
7.420
7.410
7.405
7.398
7.383
7.359
7.350
7.344
7.332
7.322
7.309
7.299
7.260
7.102
7.073
6.979
6.950

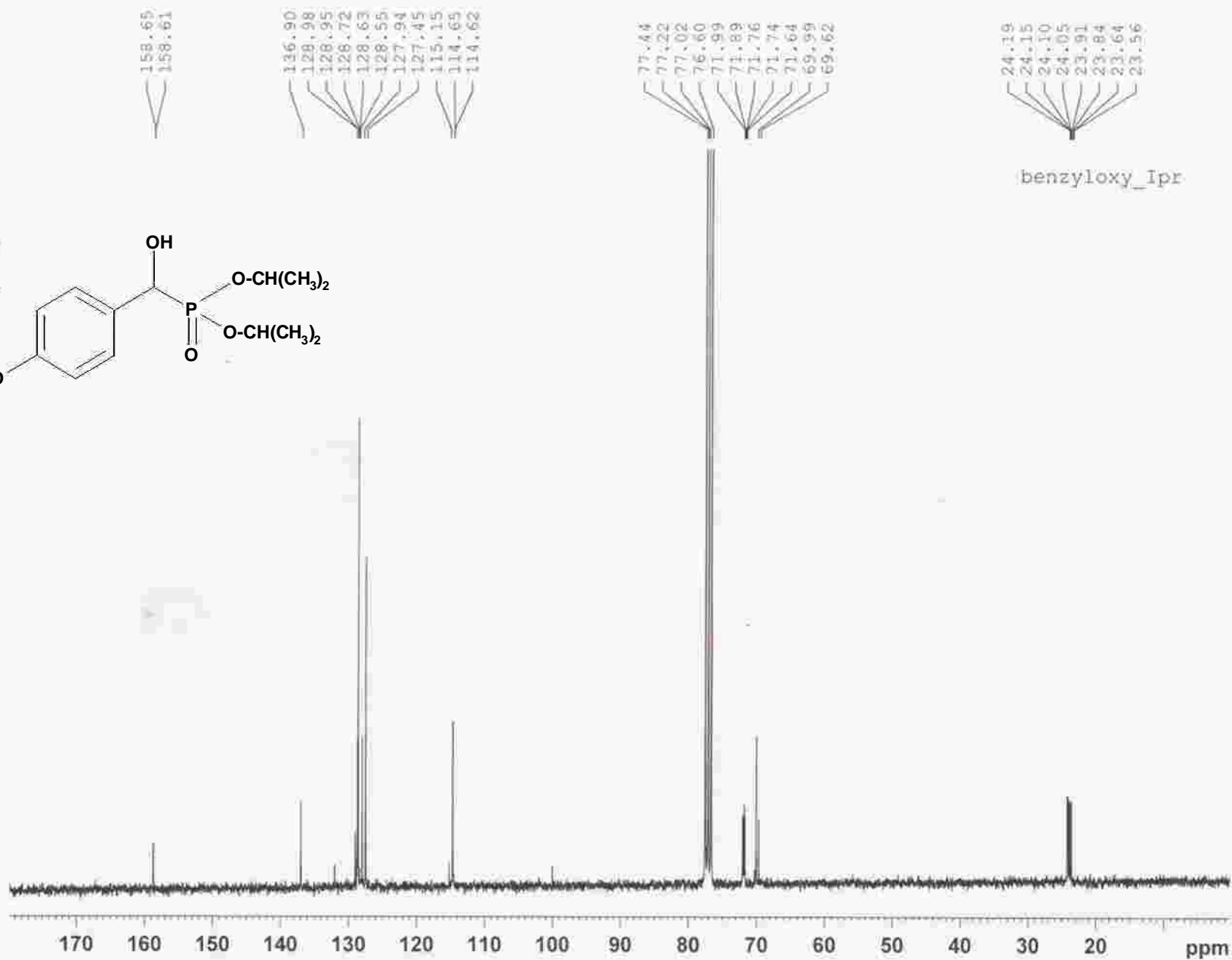
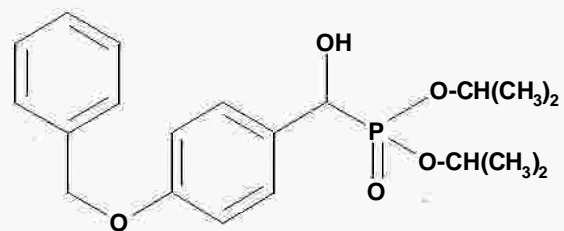
5.160
5.072
4.912
4.879
4.676
4.655
4.635
4.615
4.594
4.573

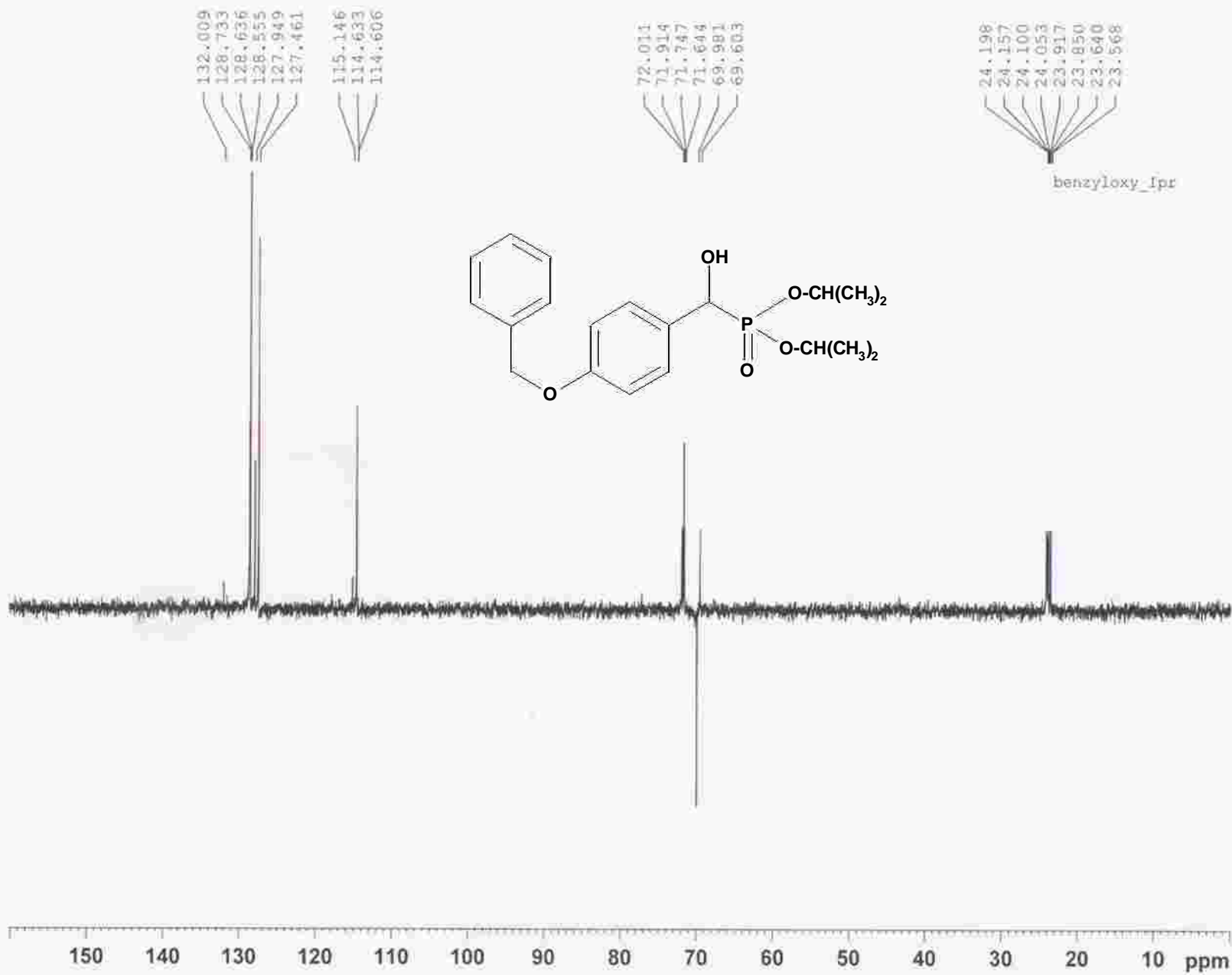
3.079

1.290
1.287
1.283
1.270
1.266
1.146
1.125

Benzyloxy_Ipr





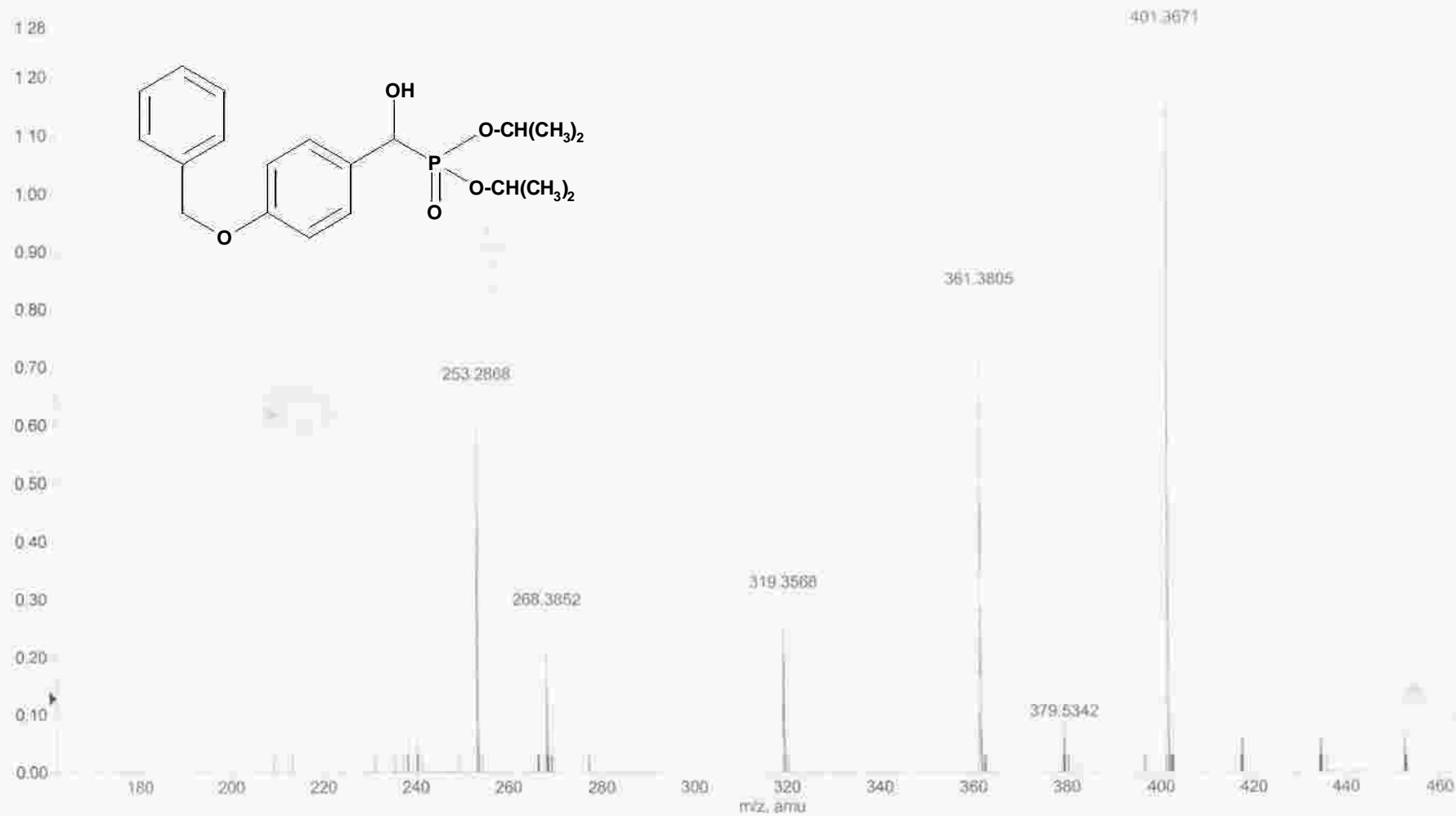


4126666 3 47347 922634

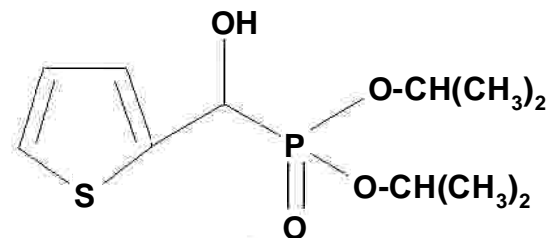
i-P₂-9

+TOF MS: 0.033 to 1.133 min from LPR-9.wiff
a=3.31839173977164490e-004 f0=-3.49418683411422530e+001

Max 1.3 counts



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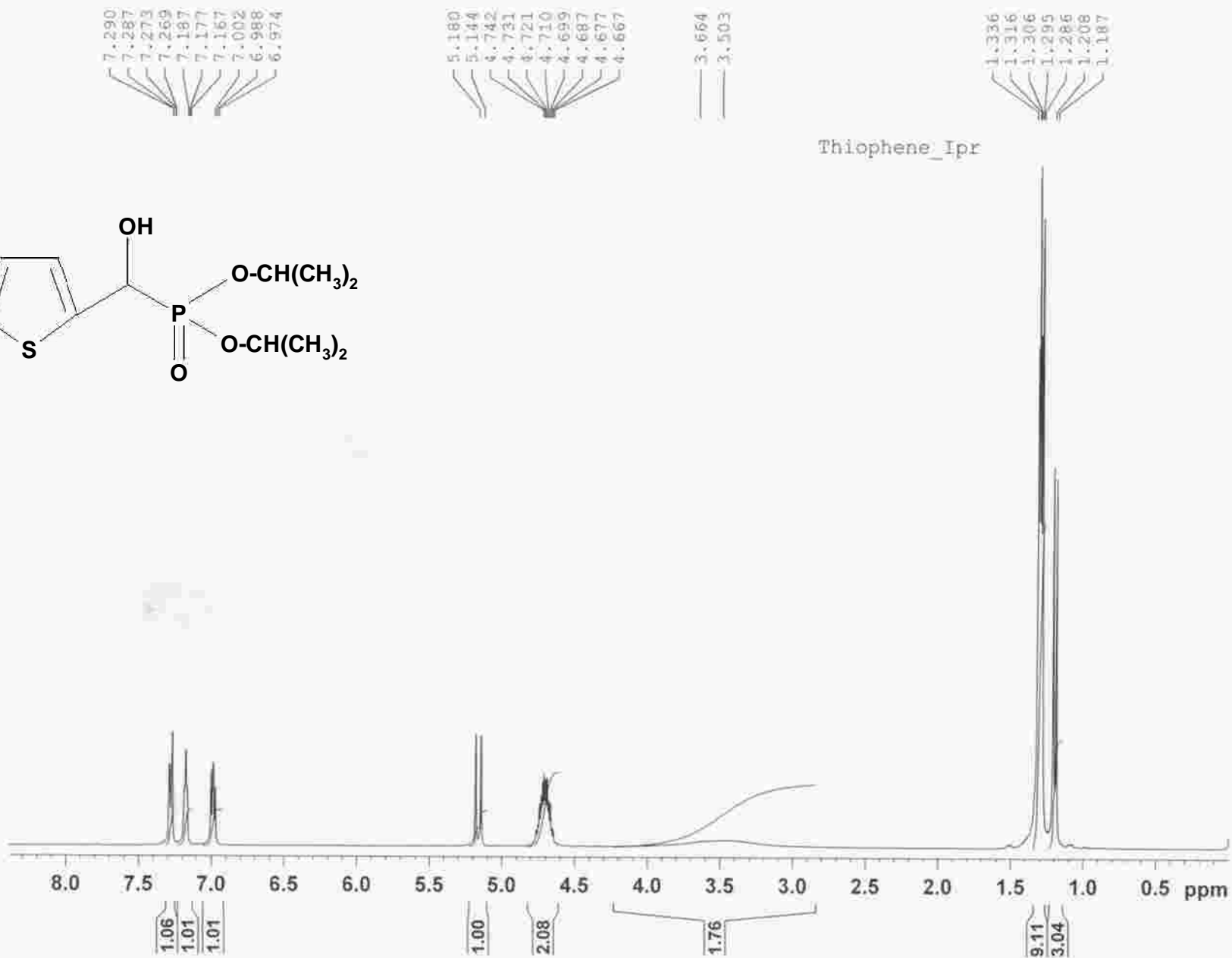
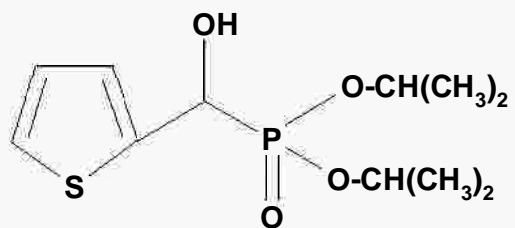
Date Created: 23 September, 2010 9:27 PM India Standard Time

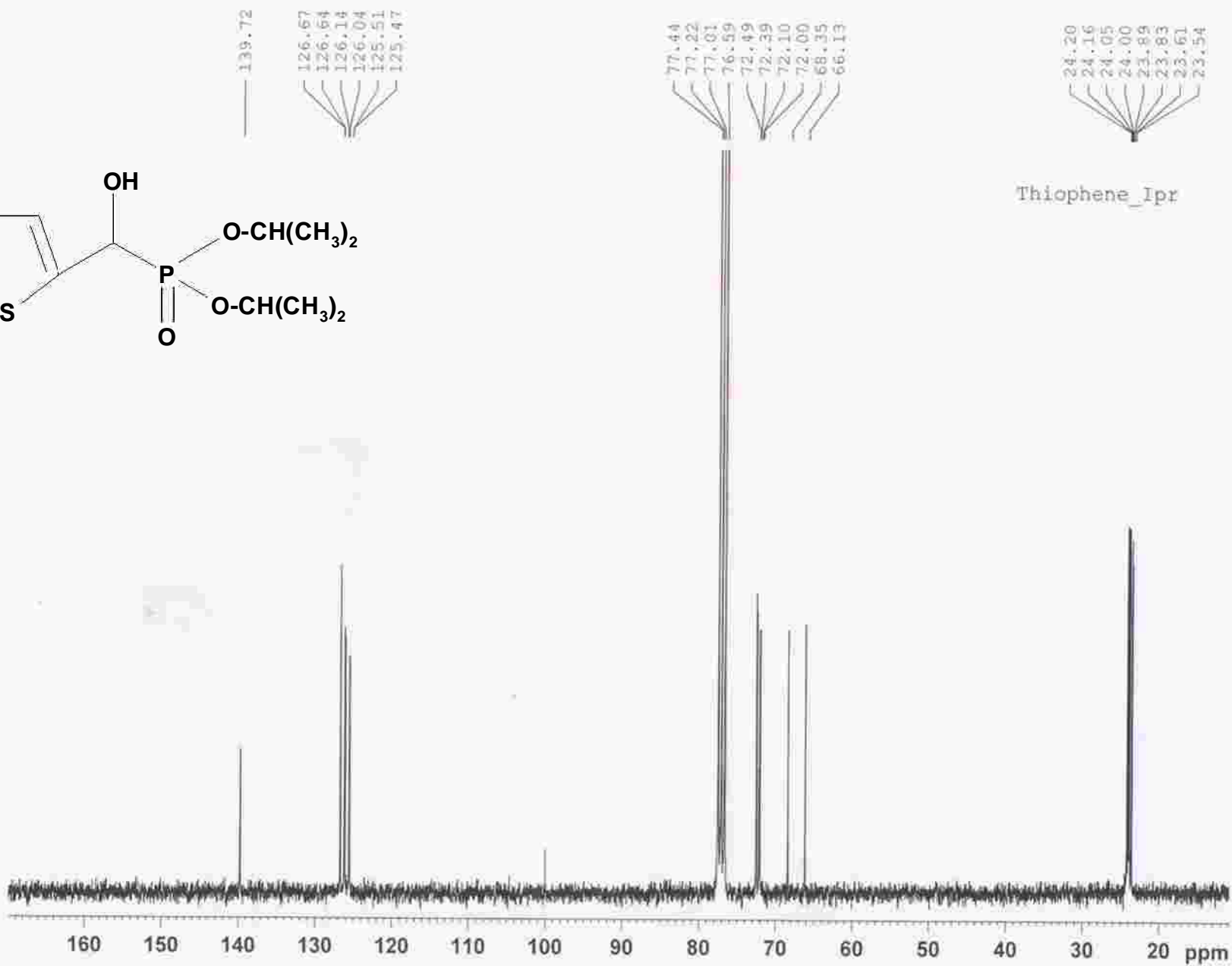
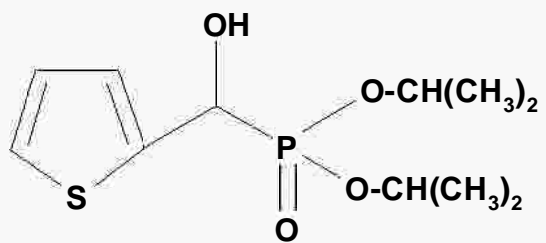
INSTRUMENT MODEL: PERKIN ELMER SPECTRUM 100.
Instrument Serial Number: 79720

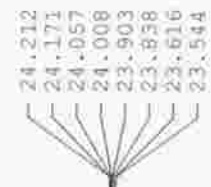
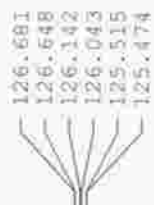
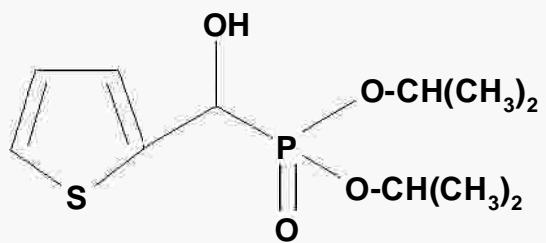
ANALYSIS:

— Thiophene-DIP.002 - 25-09-10.

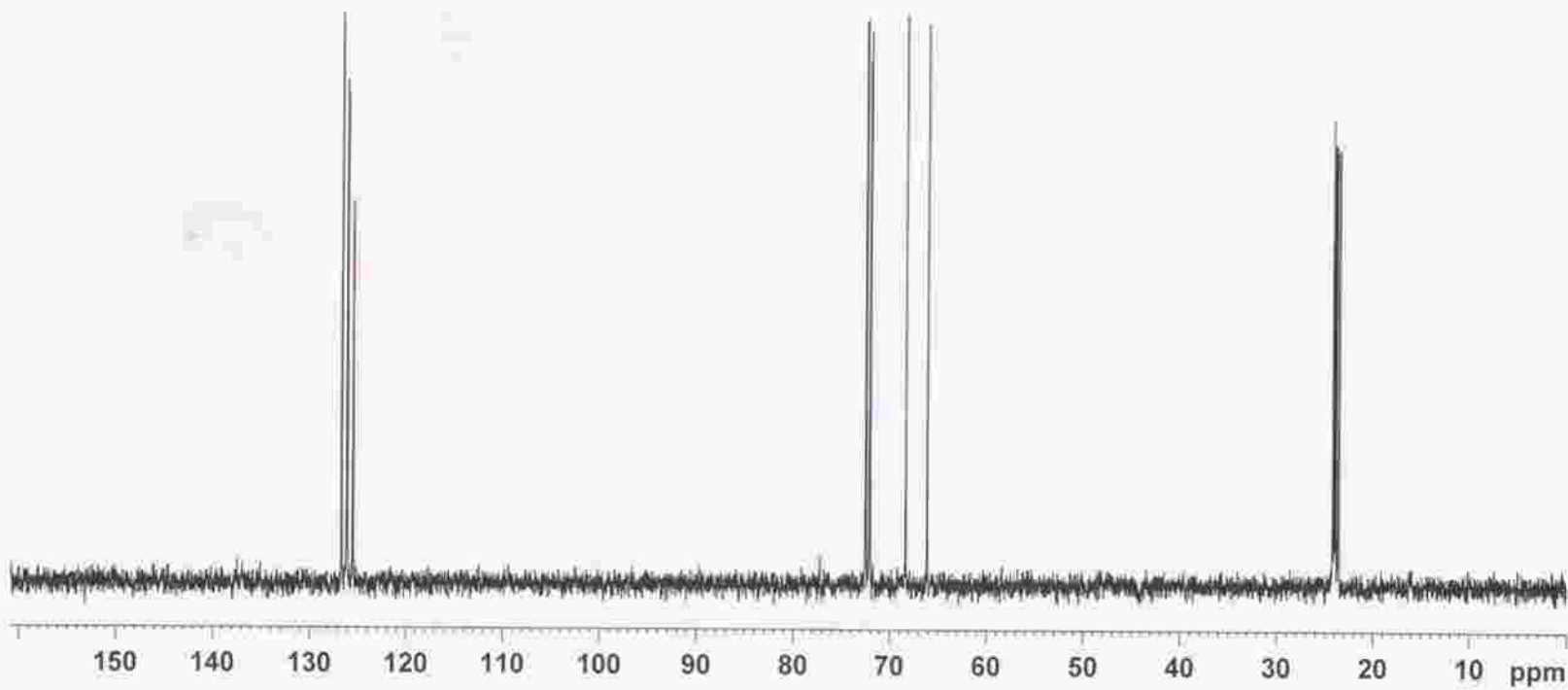
cm-1







Thiophene_Ipr



+TOF MS: 0.017 to 0.550 min from THIOPHEN_DIPR.wiff
a=3.37719425928799980e-004, t0=-3.54887063182468410e+001

Max. 335.5 counts

